US010710373B2

(12) **United States Patent**
Osakabe et al.

(10) **Patent No.: US 10,710,373 B2**
(45) **Date of Patent: *Jul. 14, 2020**

(54) **SUPPLY APPARATUS**

(71) Applicant: **BROTHER KOGYO KABUSHIKI KAISHA**, Nagoya-shi, Aichi-ken (JP)

(72) Inventors: **Yoshinori Osakabe**, Seto (JP); **Masako Kawagoe**, Nagoya (JP); **Masahiro Hayashi**, Nagoya (JP); **Taichi Shirono**, Nagoya (JP)

(73) Assignee: **BROTHER KOGYO KABUSHIKI KAISHA**, Nagoya-Shi, Aichi-Ken (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/298,305**

(22) Filed: **Mar. 11, 2019**

(65) **Prior Publication Data**

US 2019/0270312 A1 Sep. 5, 2019

Related U.S. Application Data

(63) Continuation of application No. 15/883,554, filed on Jan. 30, 2018, now Pat. No. 10,226,932.

(30) **Foreign Application Priority Data**

Jan. 31, 2017 (JP) 2017-016366

(51) **Int. Cl.**
B41J 2/175 (2006.01)
B41J 2/145 (2006.01)
B41J 29/13 (2006.01)

(52) **U.S. Cl.**
CPC ***B41J 2/17513*** (2013.01); ***B41J 2/145*** (2013.01); ***B41J 2/1752*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC B41J 2/145; B41J 2/175; B41J 2/17509; B41J 2/17513; B41J 2/1752; B41J 2/17523; B41J 2/17553; B41J 2/17566; B41J 29/13
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,777,646 A * 7/1998 Barinaga B41J 2/17513 347/86
6,378,971 B1 * 4/2002 Tamura B41J 2/175 347/7
(Continued)

FOREIGN PATENT DOCUMENTS

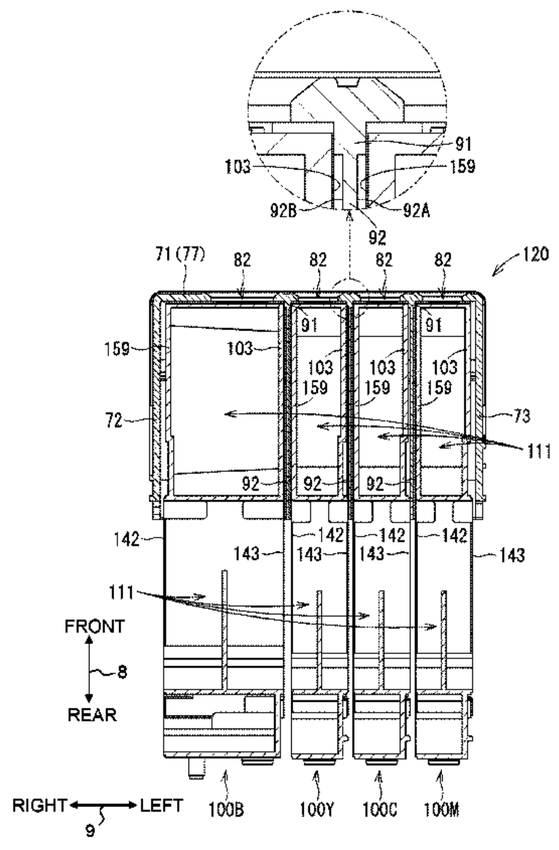
JP 2012-51306 A 3/2012
JP 5429425 B2 2/2014
(Continued)

Primary Examiner — Anh T Vo
(74) *Attorney, Agent, or Firm* — Merchant & Gould P.C.

(57) **ABSTRACT**

A supply apparatus includes: tanks; a binder which holds the tanks in a state of being arranged in a first direction; a casing which supports the binder; and a positioning part disposed between adjacent two tanks, the positioning part positioning the two tanks at an interval in the first direction. Each tank includes two side walls facing the first direction to define a liquid storage chamber and an inlet to supply liquid to the liquid storage chamber. The two side walls include portions formed from resin. At least one of the two side walls includes a portion formed from a film. The positioning part is in contact with: the portion formed from the resin of one of the two side walls of one of the two tanks; and the portion formed from the resin of one of the two side walls of the other of the two tanks.

4 Claims, 16 Drawing Sheets



(52) **U.S. Cl.**
CPC ***B41J 2/17509*** (2013.01); ***B41J 2/17523*** (2013.01); ***B41J 2/17553*** (2013.01); ***B41J 2/17566*** (2013.01); ***B41J 29/13*** (2013.01)

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,126,414	B2	9/2015	Iwamuro et al.	
10,226,932	B2 *	3/2019	Osakabe	B41J 2/17523
2005/0134636	A1	6/2005	Matsuba et al.	
2012/0056938	A1	3/2012	Ishizawa et al.	
2014/0132678	A1	5/2014	Iwamuro et al.	
2018/0281432	A1	10/2018	Kanaya et al.	

FOREIGN PATENT DOCUMENTS

JP	5621902	B2	11/2014
JP	2015-27807	A	2/2015

* cited by examiner

Fig. 1A

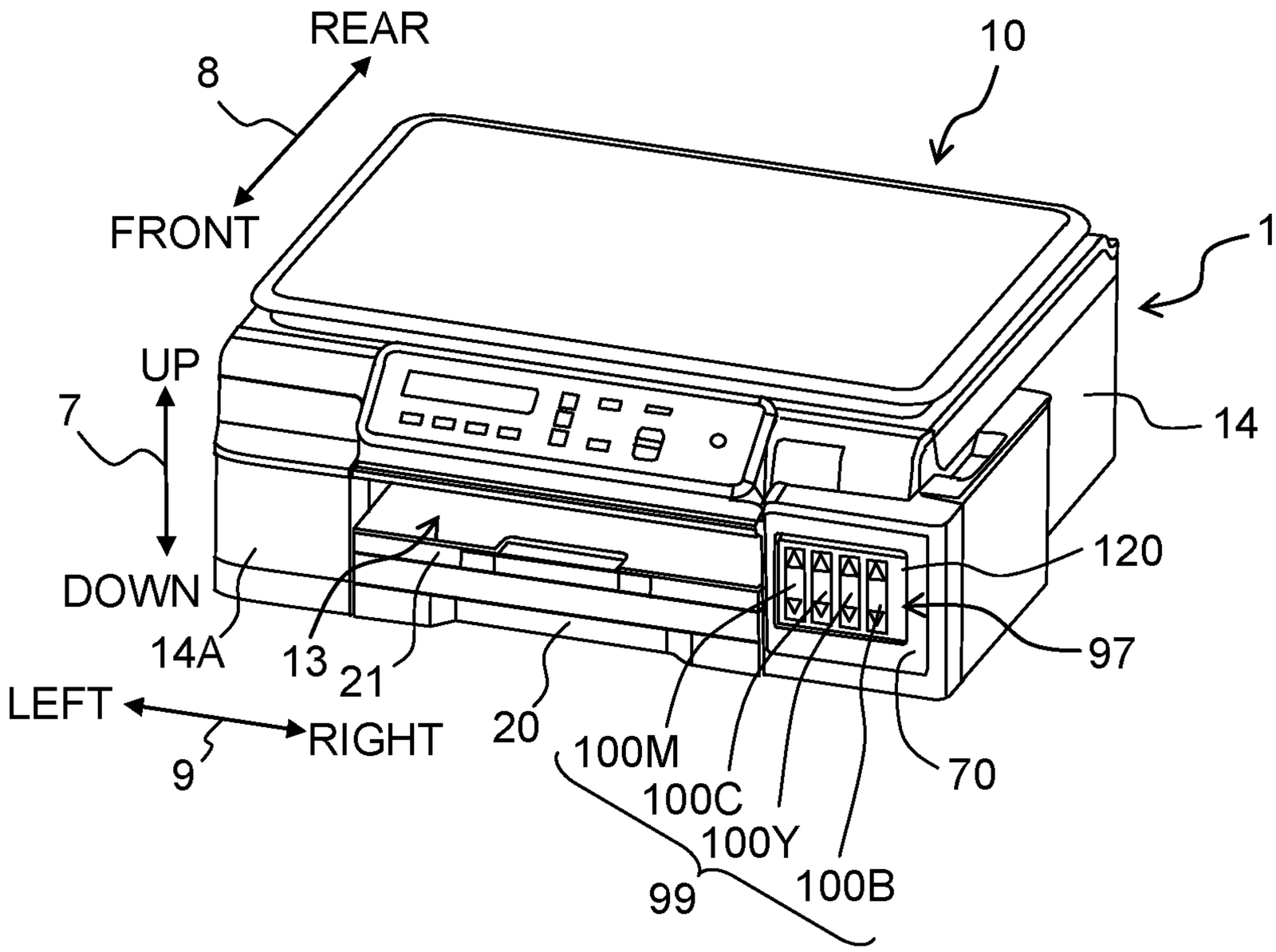

REAR
8
FRONT
10
11
UP
7
DOWN
14
120
97
14A
13
21
20
LEFT
9
RIGHT
100M
100C
100Y
100B
99
70

Fig. 1B

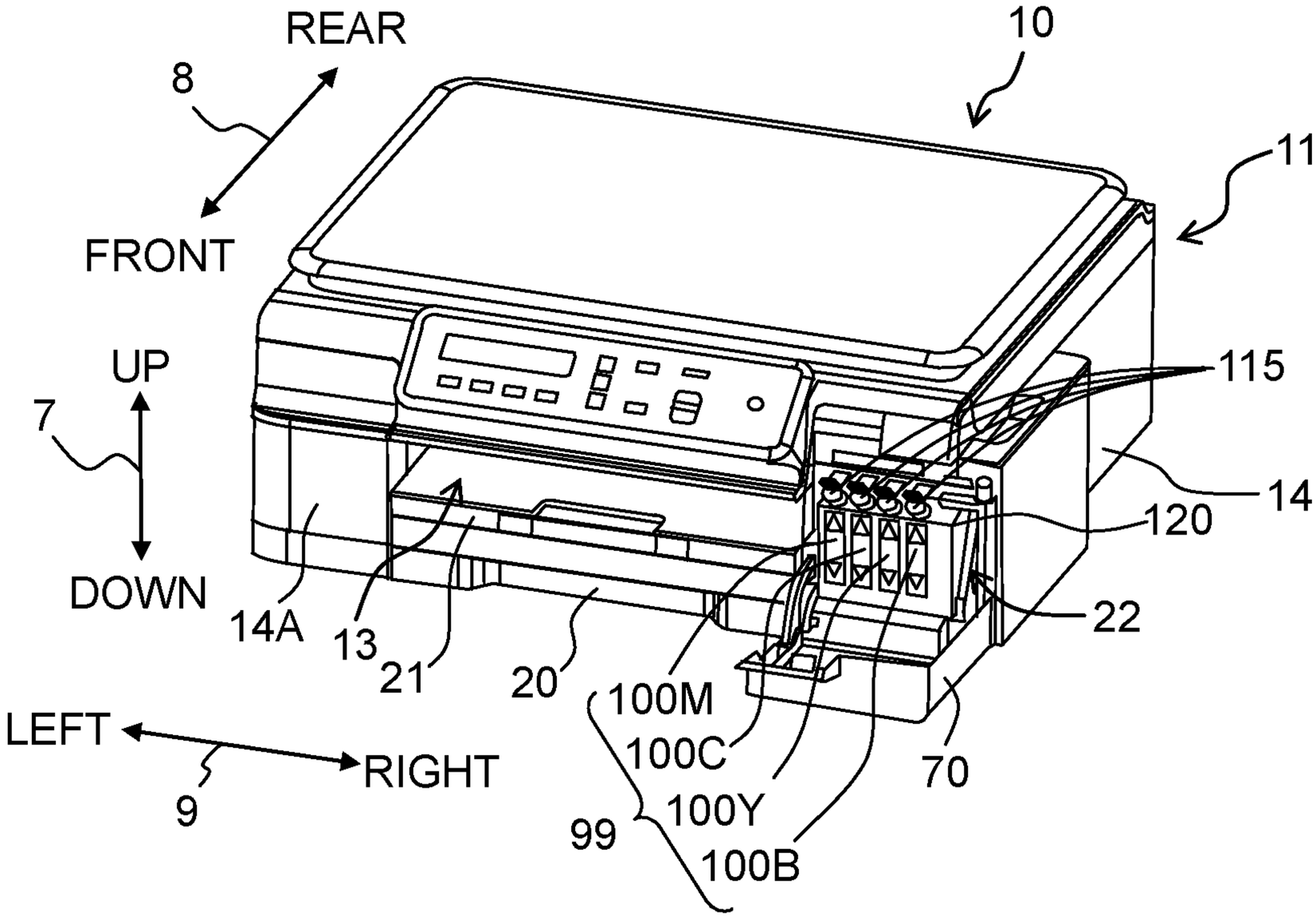

REAR
8
FRONT
10
11
UP
7
DOWN
115
14
120
22
14A
13
21
20
LEFT
9
RIGHT
100M
100C
100Y
100B
99
70

Fig. 2

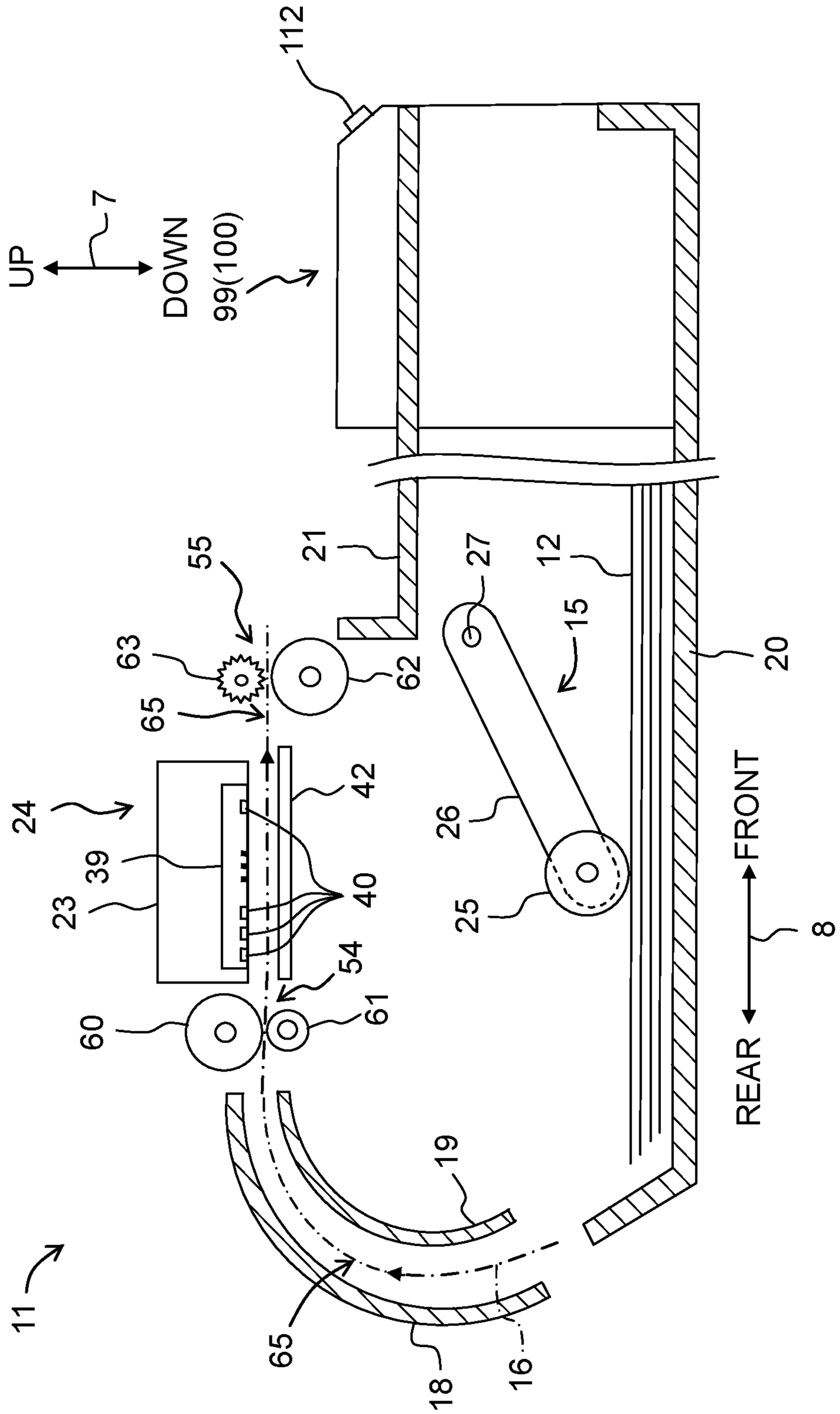

112
UP
7
DOWN
99(100)
55
21
27
12
63
15
65
62
20
24
42
26
39
40
23
54
25
FRONT
8
60
61
REAR
19
11
65
18
16

Fig. 3

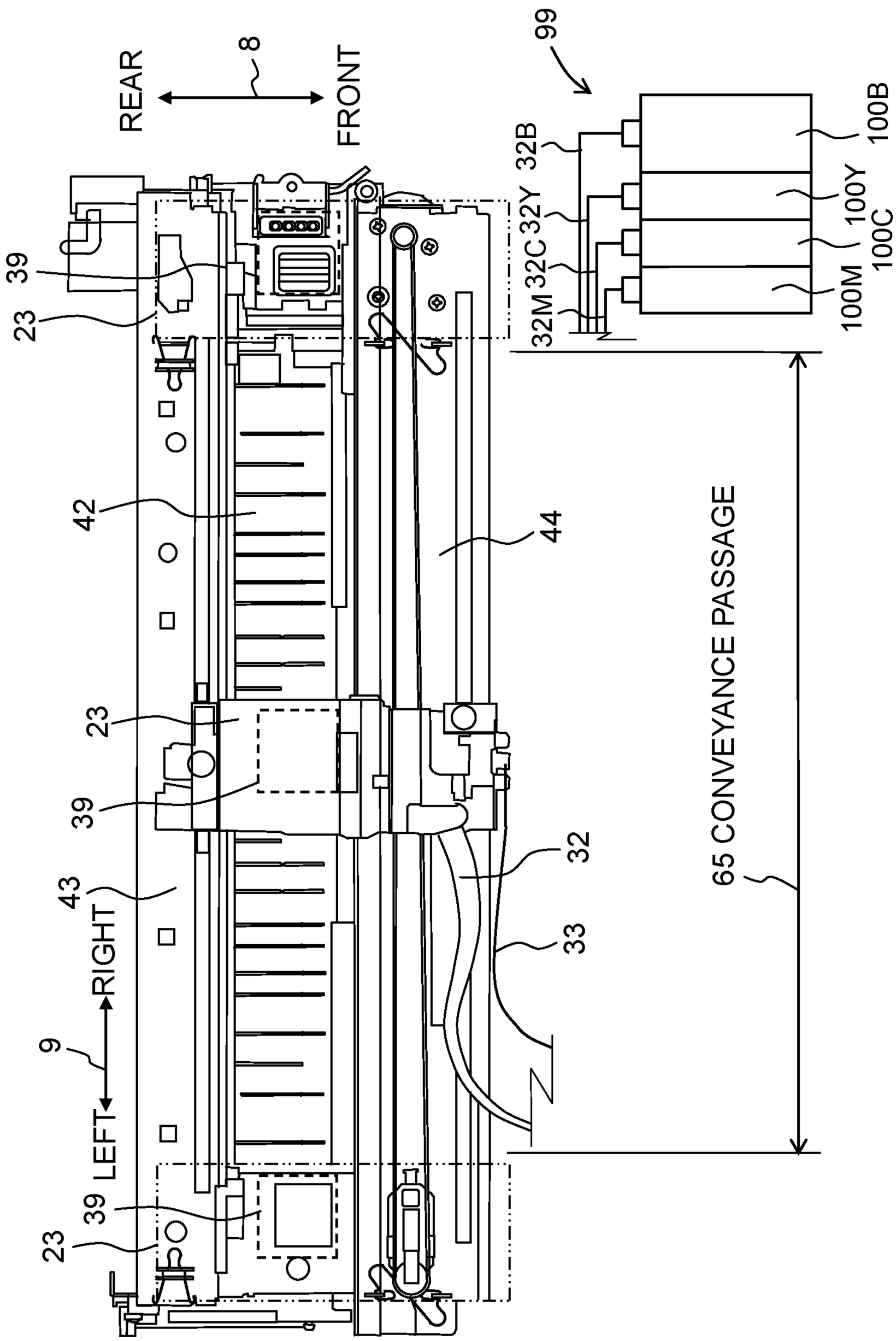

REAR
8
FRONT
99
32B
32Y
32C
32M
100B
100Y
100C
100M
39
23
42
44
23
39
43
RIGHT
9
LEFT
39
23
32
33
65 CONVEYANCE PASSAGE

Fig. 4A

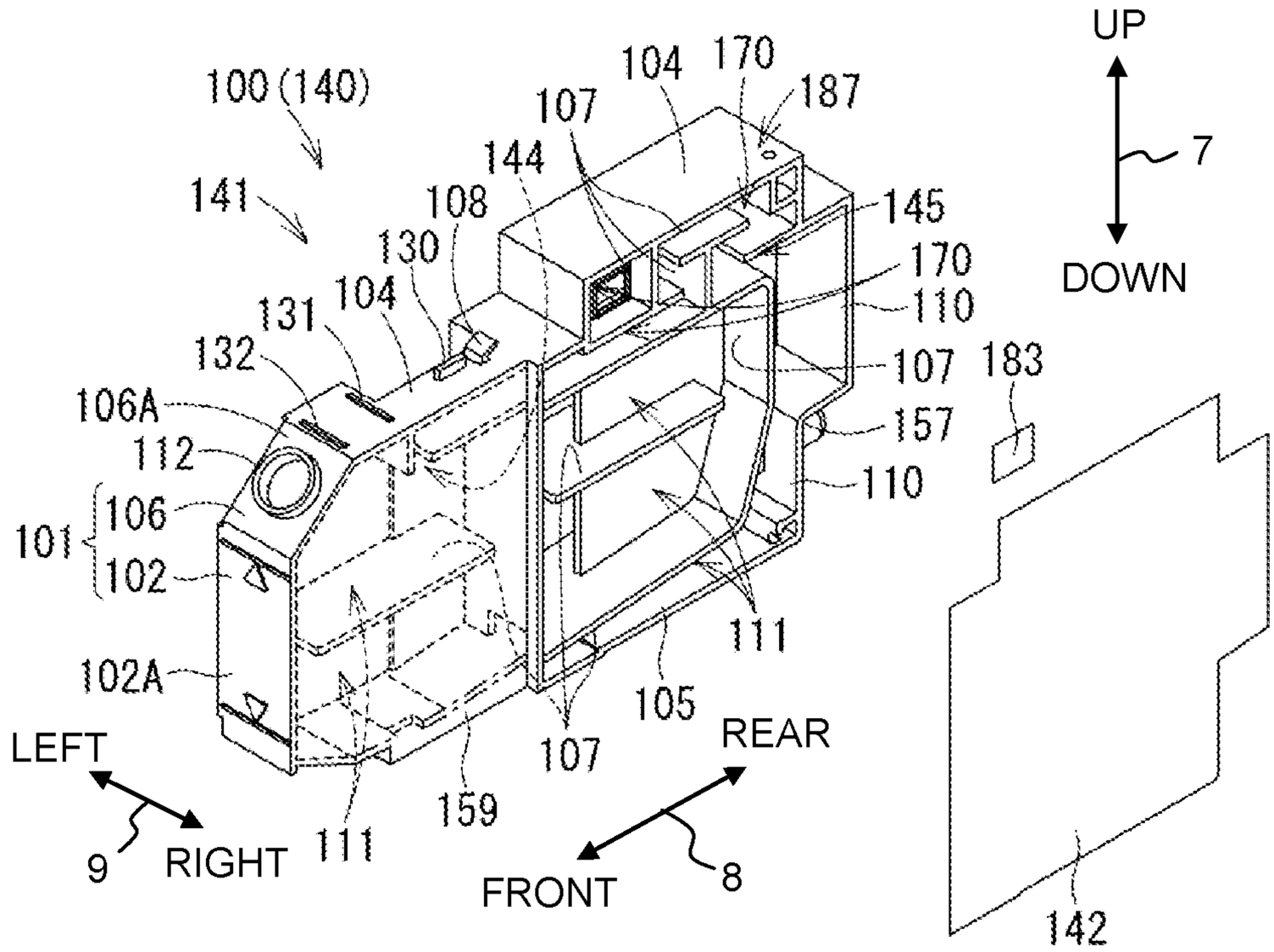

100 (140)
141
107
104
170
187
144
108
145
130
170
104
110
131
107
183
132
106A
157
112
110
106
101
102
111
102A
105
REAR
LEFT
107
159
111
9
RIGHT
FRONT
8
UP
7
DOWN
142

Fig. 4B

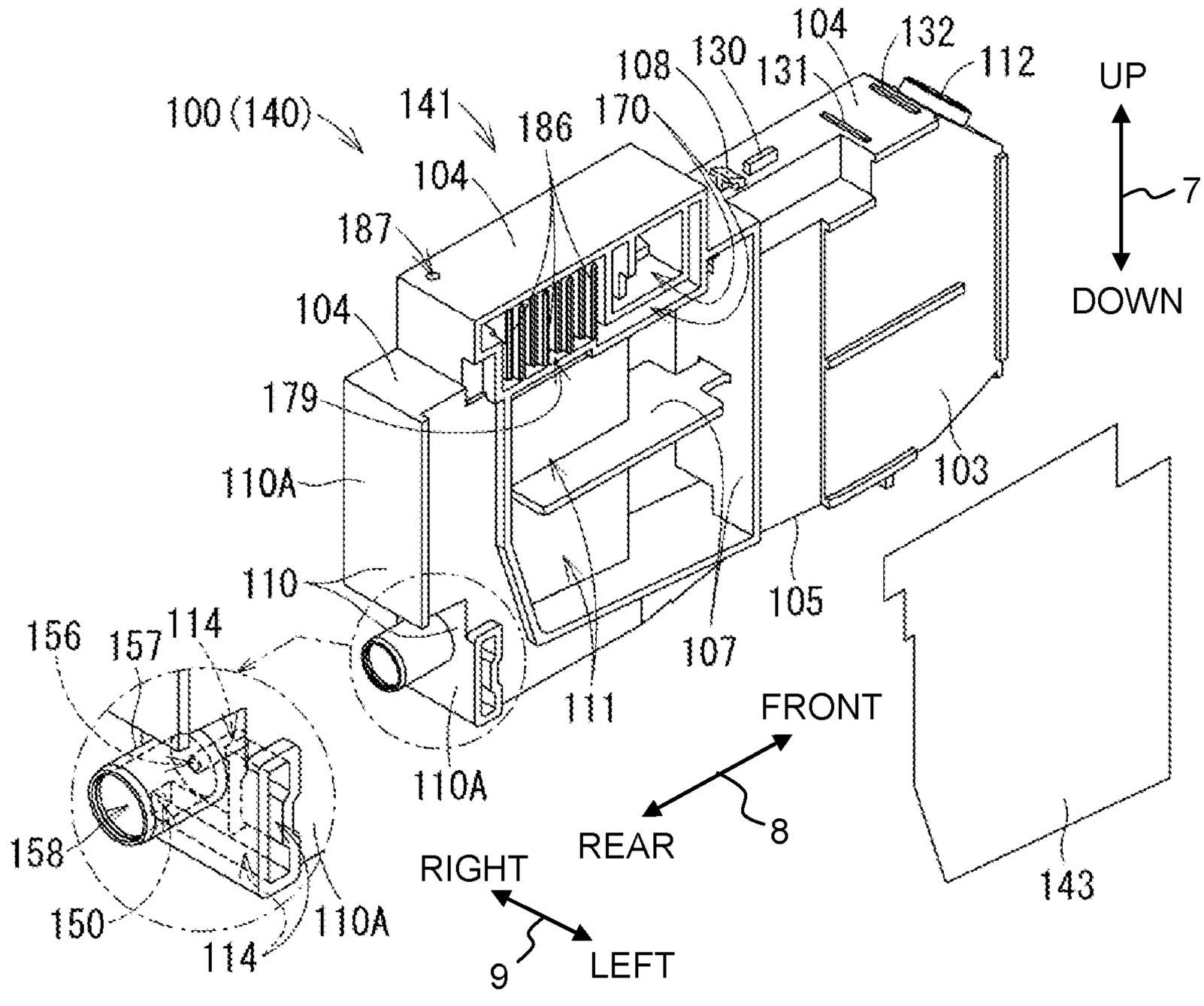

104
132
108
130
131
112
100 (140)
141
186
170
UP
104
7
187
104
DOWN
179
110A
110
156
157
114
105
107
111
FRONT
110A
158
REAR
8
150
110A
RIGHT
114
9
LEFT
103
143

Fig. 5A

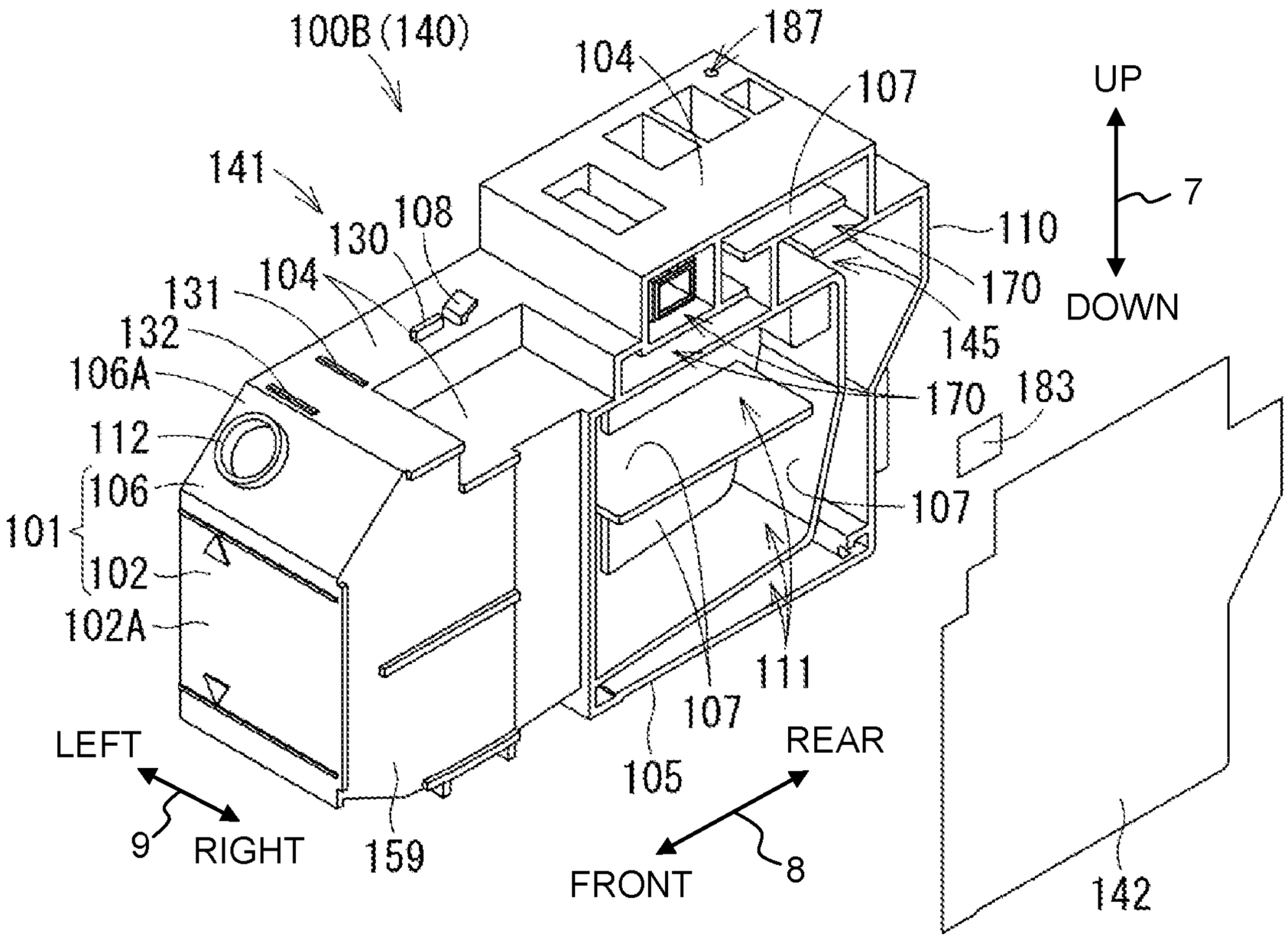

100B (140)
187
104
107
UP
7
DOWN
141
130
108
110
170
145
131
104
132
106A
170
183
112
106
101
107
102
102A
111
107
105
REAR
LEFT
9
RIGHT
159
FRONT
8
142

Fig. 5B

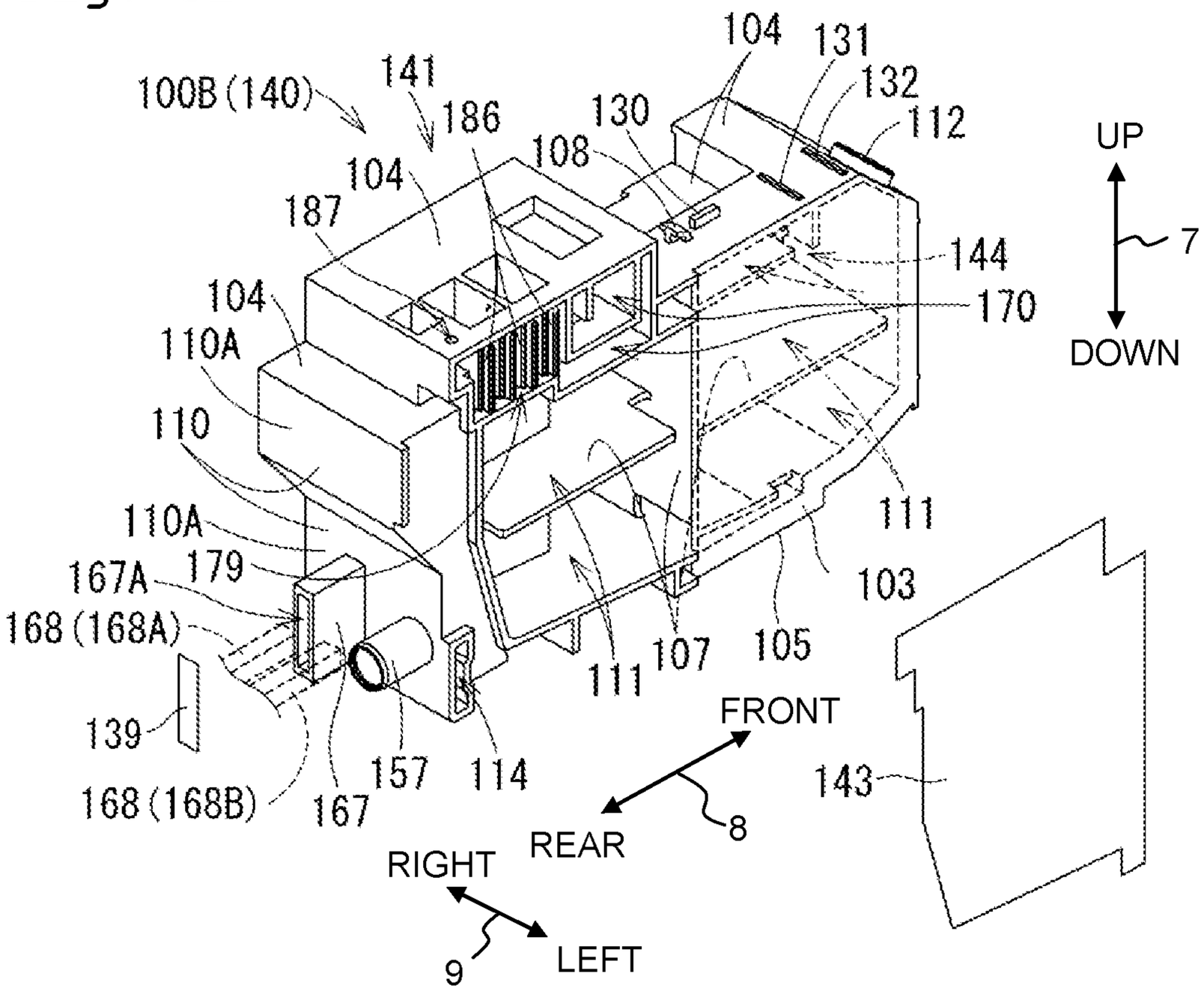

104
131
132
141
100B (140)
186
130
112
108
UP
104
187
144
7
104
170
DOWN
110A
110
111
110A
103
167A
179
168 (168A)
111
107
105
FRONT
139
157
114
143
168 (168B)
167
REAR
8
RIGHT
9
LEFT

Fig. 6

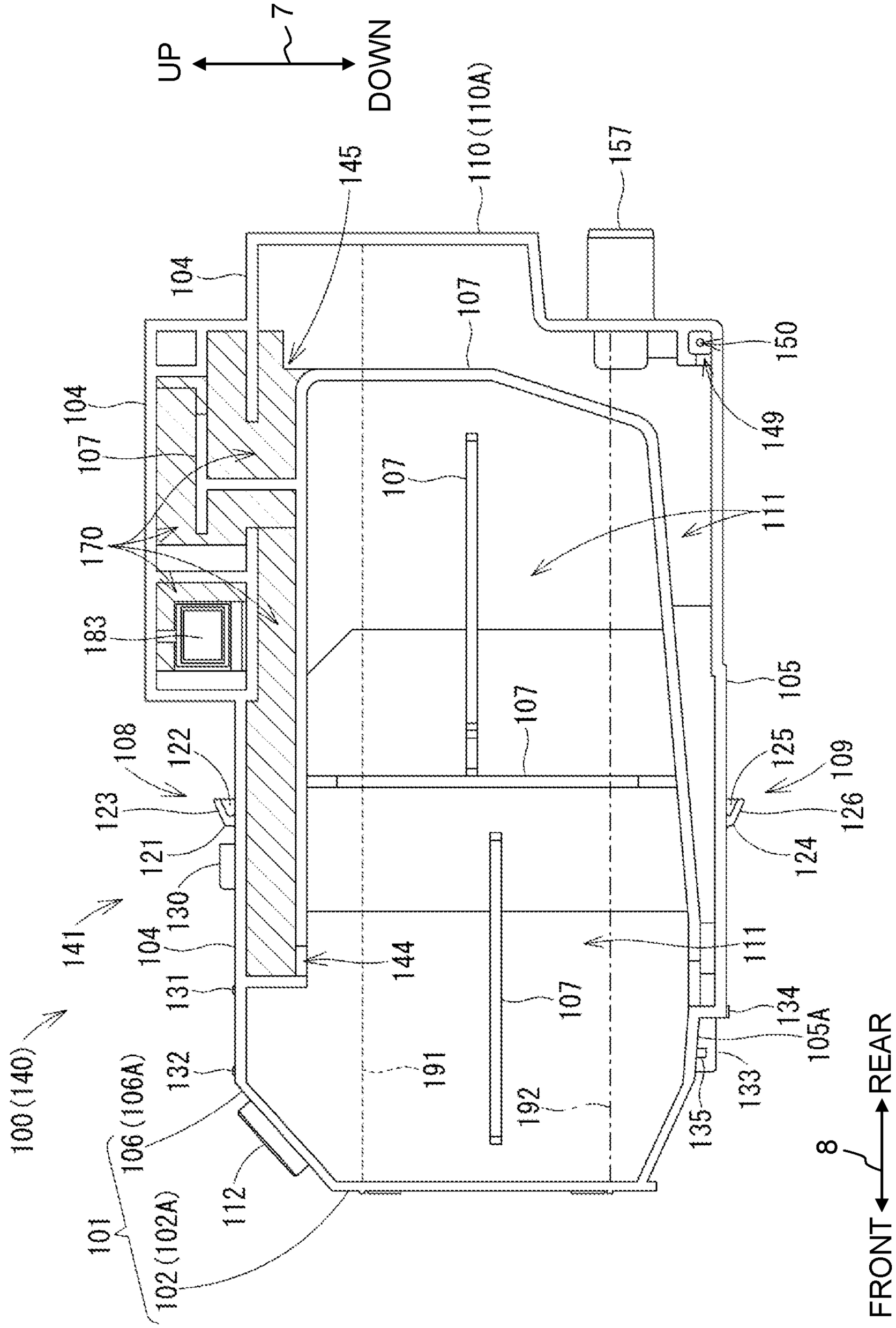

UP
7
DOWN
145
110(110A)
157
104
107
150
104
107
149
107
170
111
183
105
107
108
122
125
109
123
126
121
124
130
141
104
144
111
131
107
134
105A
100(140)
132
191
133
106(106A)
192
135
112
101
102(102A)
8
FRONT
REAR

Fig. 7A

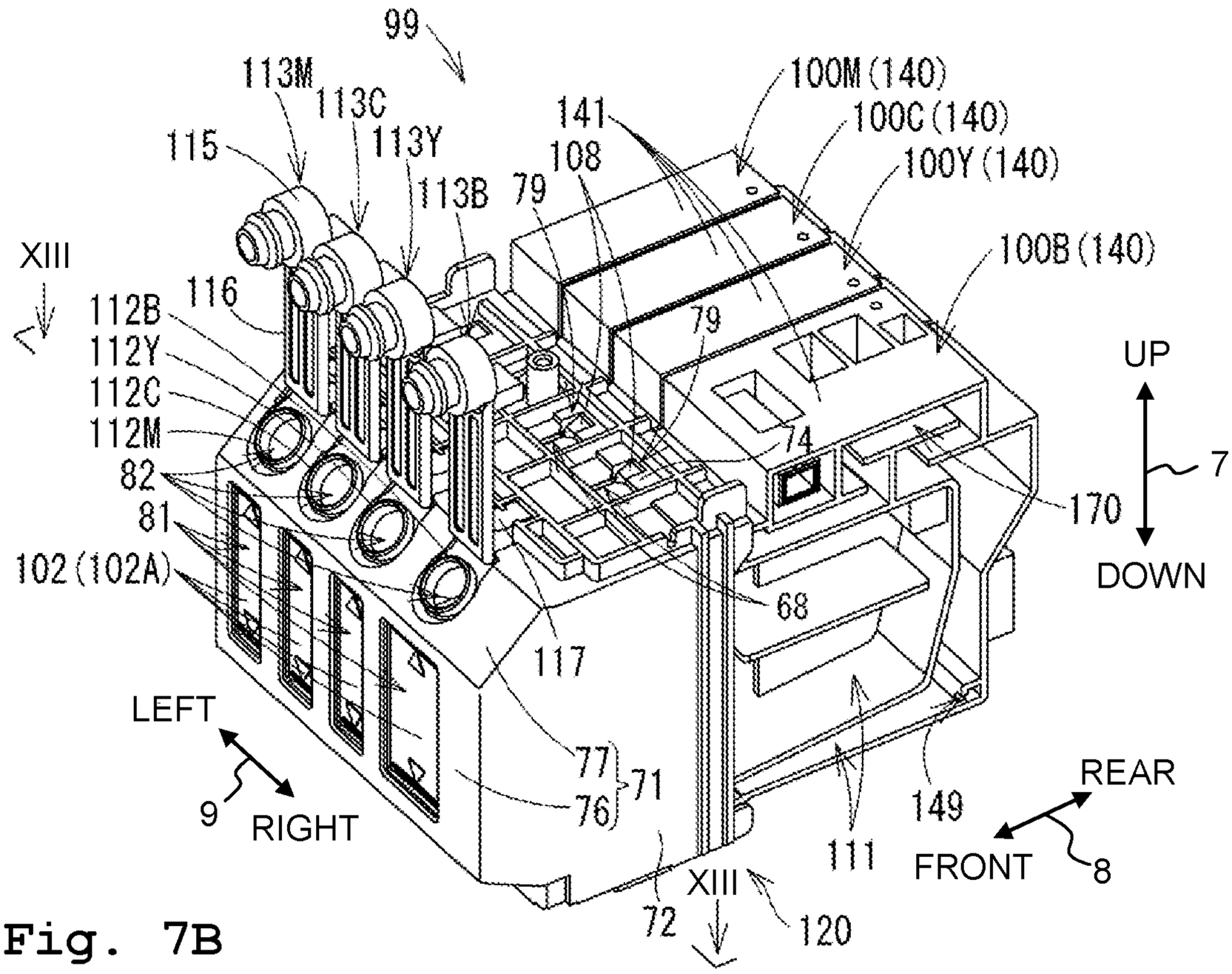

99
113M
113C
113Y
113B
115
141
108
79
100M (140)
100C (140)
100Y (140)
100B (140)
XIII
116
112B
112Y
112C
112M
82
81
102 (102A)
79
74
UP
7
170
DOWN
68
117
LEFT
9
RIGHT
77
76
71
149
REAR
FRONT
8
111
XIII
72
120

Fig. 7B

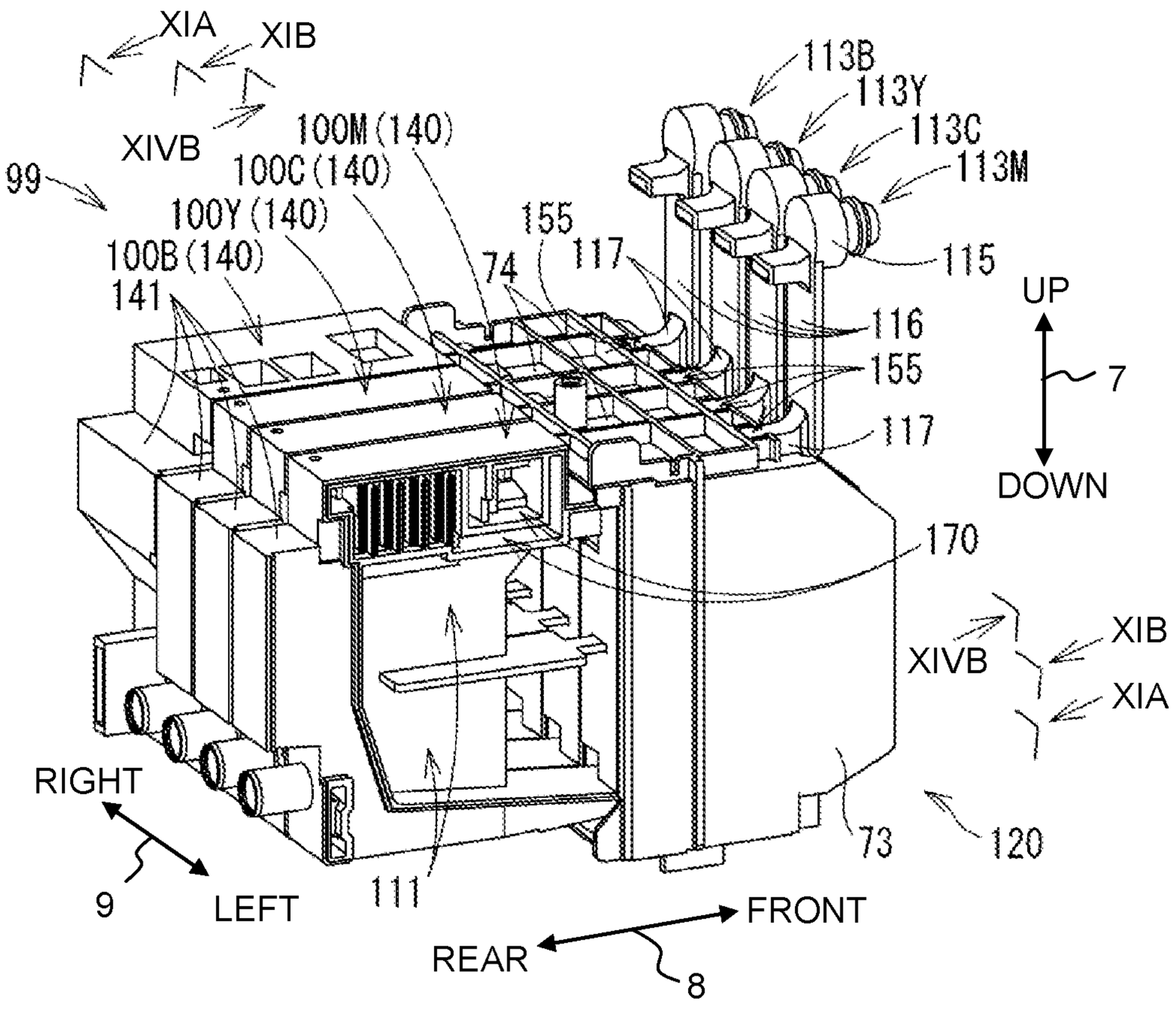

XIA
XIB
XIVB
99
100M (140)
100C (140)
100Y (140)
100B (140)
141
155
74
117
113B
113Y
113C
113M
115
UP
7
DOWN
116
155
117
170
XIB
XIVB
XIA
RIGHT
9
LEFT
111
73
120
REAR
FRONT
8

Fig. 8A

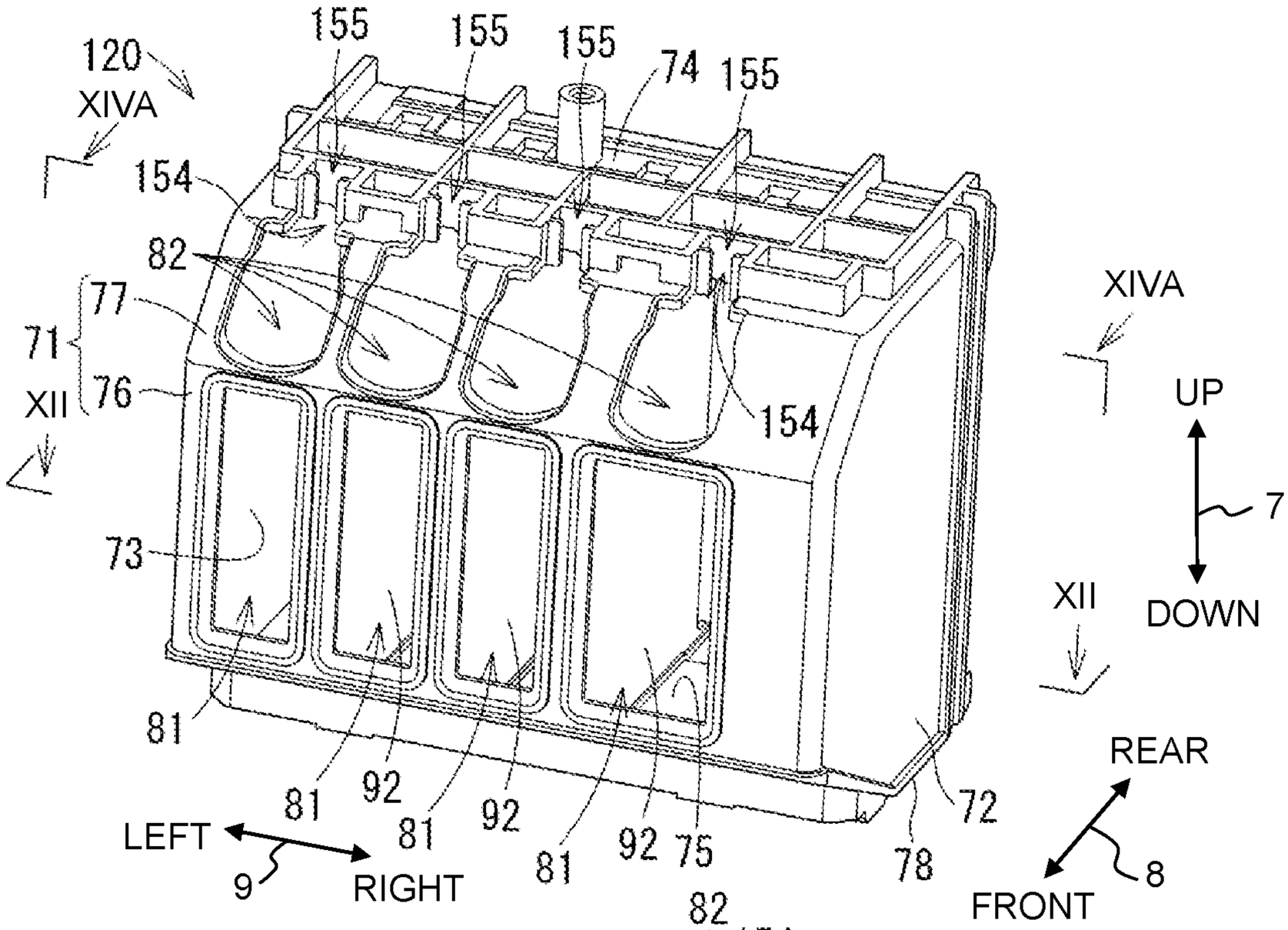
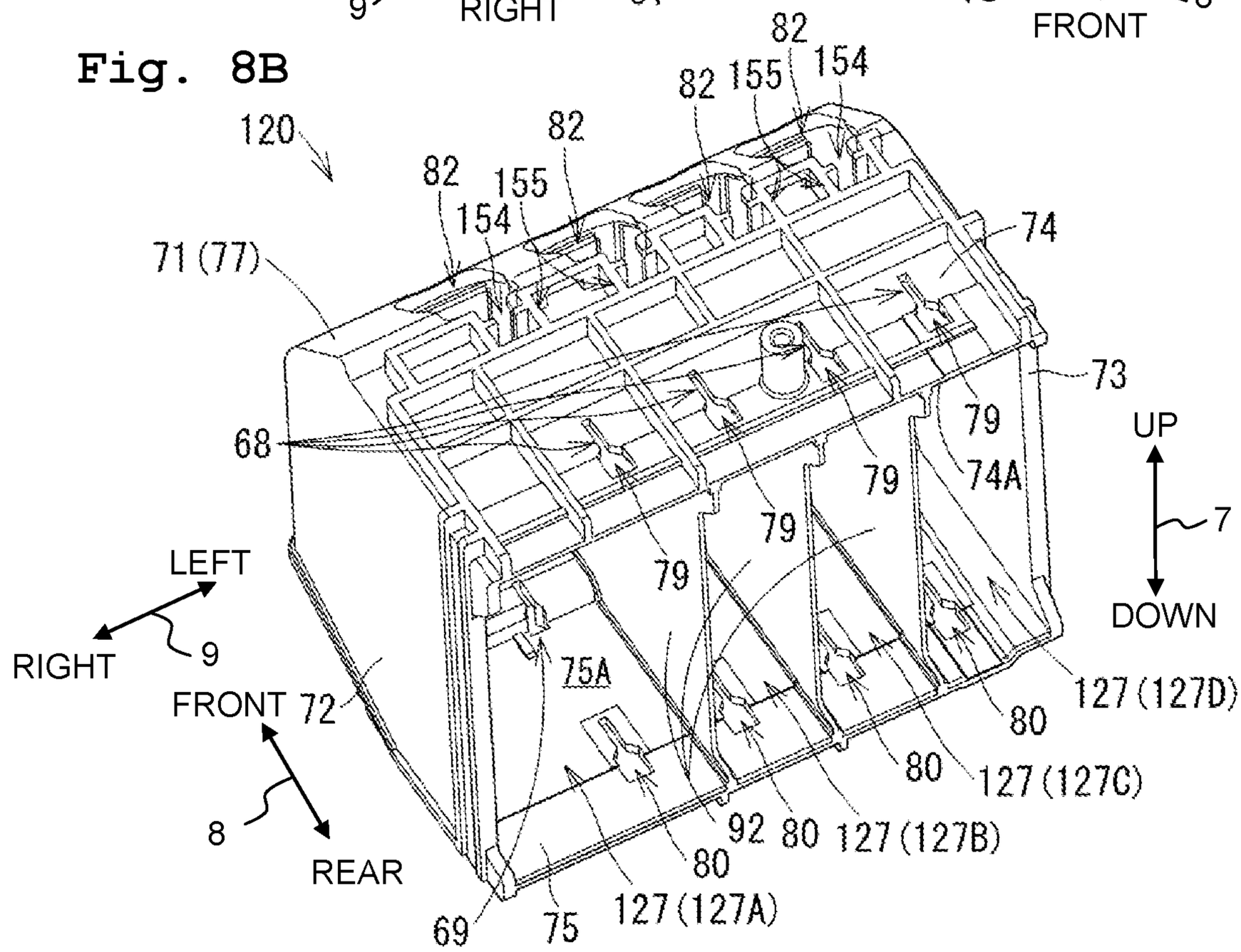

155
155
155
74
155
120
XIVA
154
82
77
71
76
XII
154
73
81
81
92
81
92
81
92
75
72
78
LEFT
9
RIGHT
XIVA
UP
7
XII
DOWN
REAR
8
FRONT

Fig. 8B


82
82
155
154
120
82
82
155
154
74
71 (77)
73
68
79
74A
79
79
79
UP
7
DOWN
LEFT
RIGHT
9
75A
FRONT
72
127 (127D)
80
80
127 (127C)
8
92
80
127 (127B)
REAR
80
69
75
127 (127A)

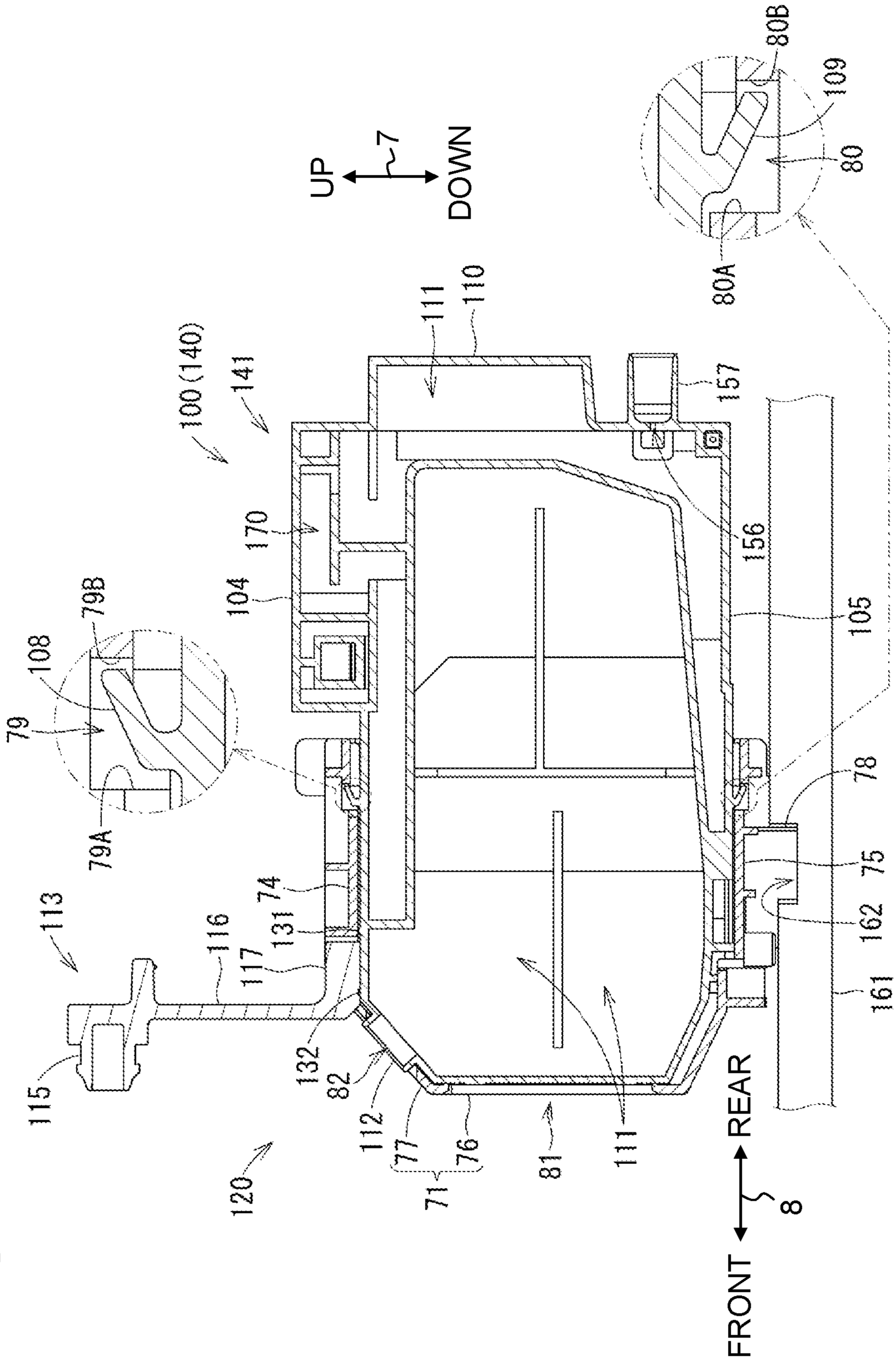

UP
7
DOWN
80B
109
80
A
111
117
157
156
100 (140)
141
170
104
79B
108
79
105
78
79A
75
74
131
116
162
113
161
132
82
112
77
76
71
81
111
120
115
FRONT
REAR
8

Fig. 9

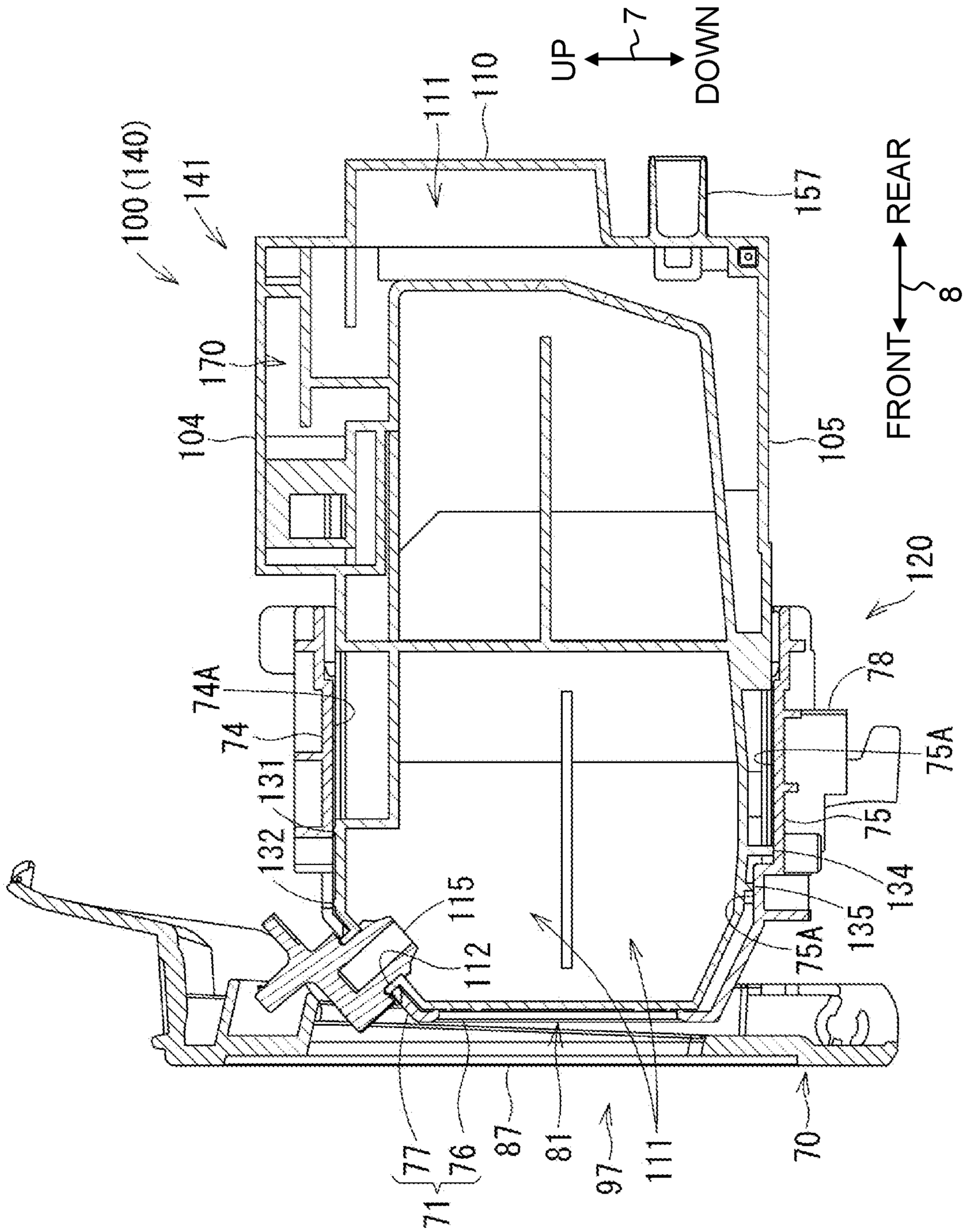

100(140)
141
111
110
UP
7
DOWN
157
REAR
8
FRONT
170
104
105
120
74A
74
131
78
75A
75
132
115
112
134
135
75A
77
76
87
81
97
111
70

Fig. 10

Fig. 11A

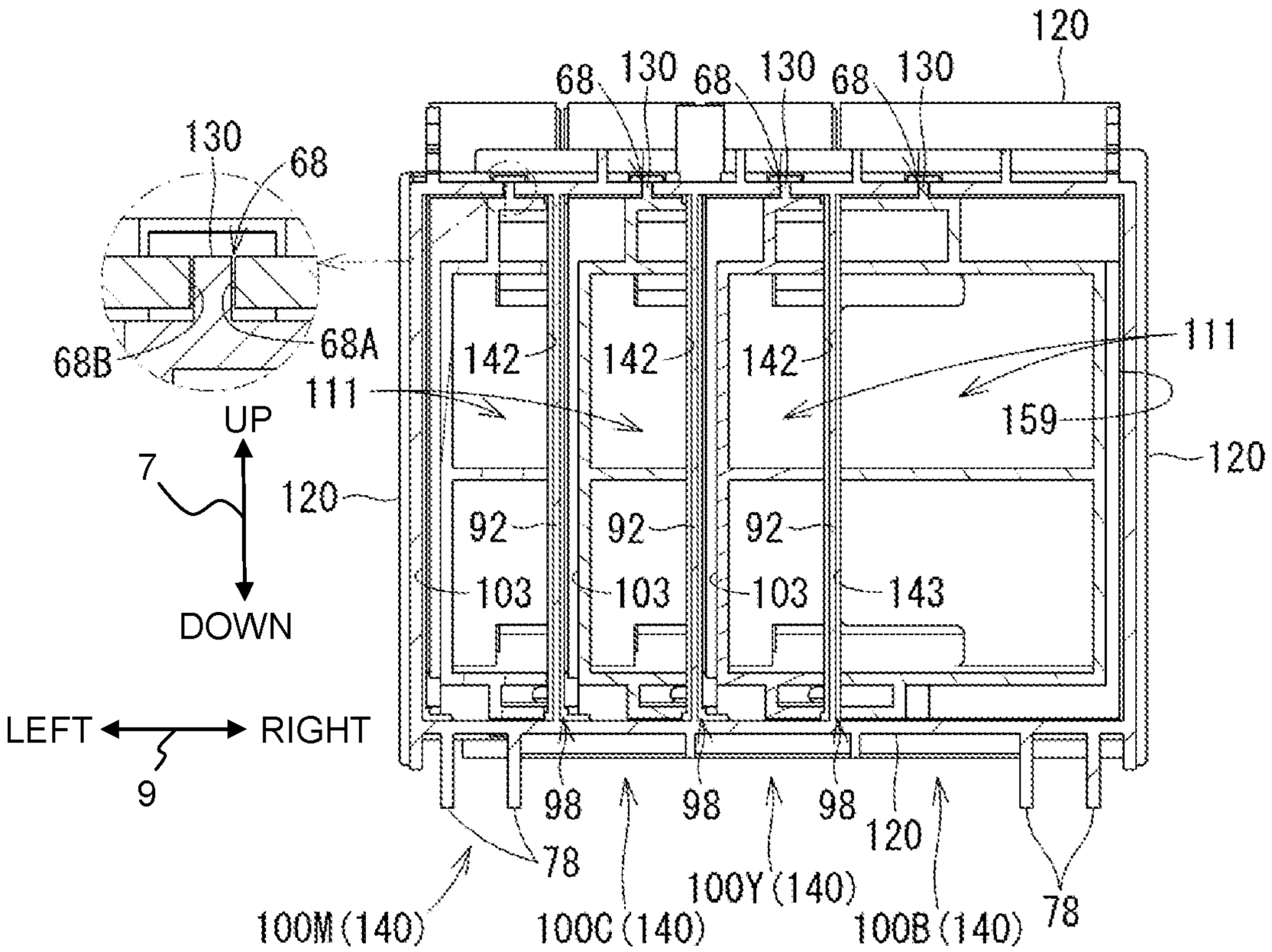
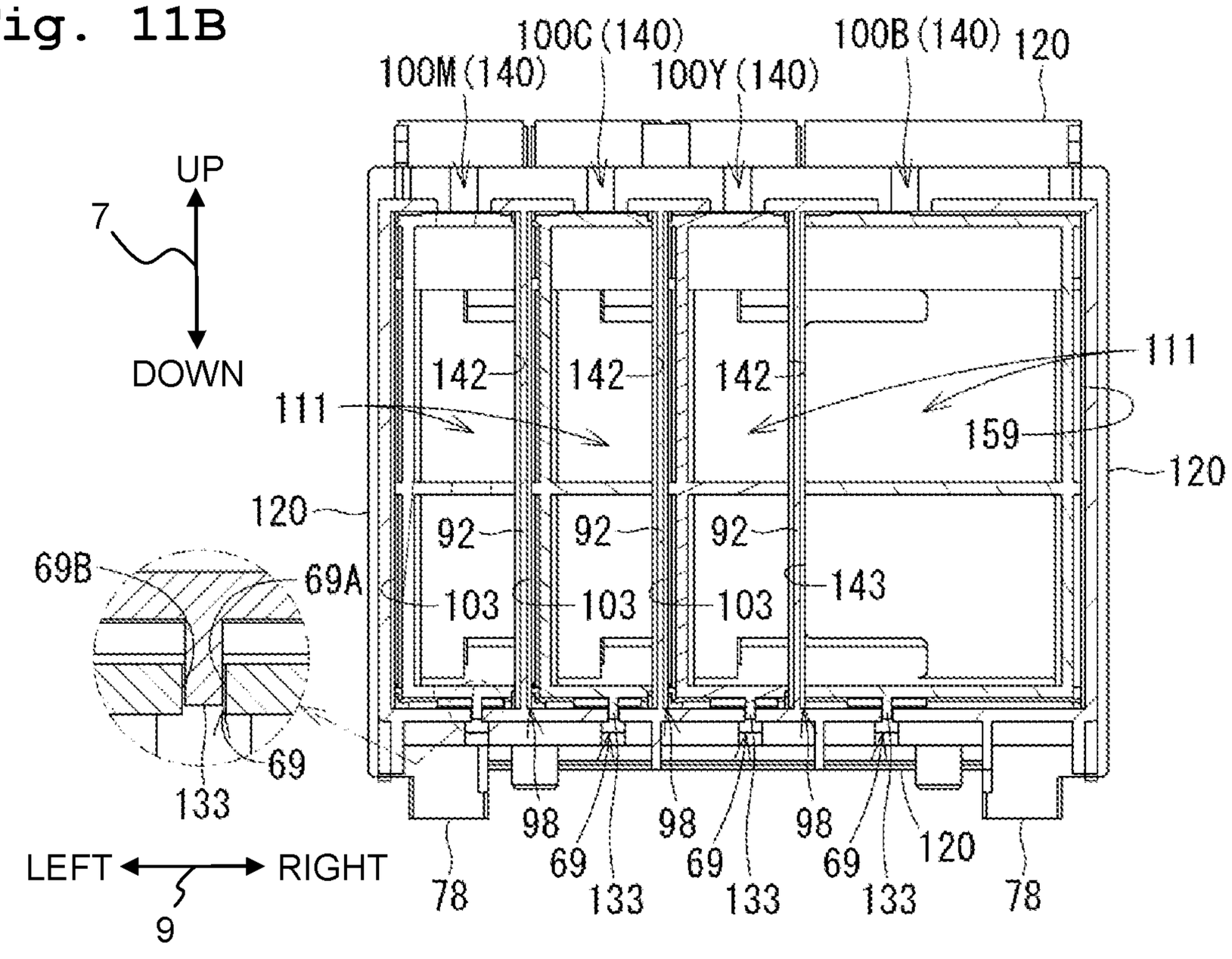


Fig. 11B



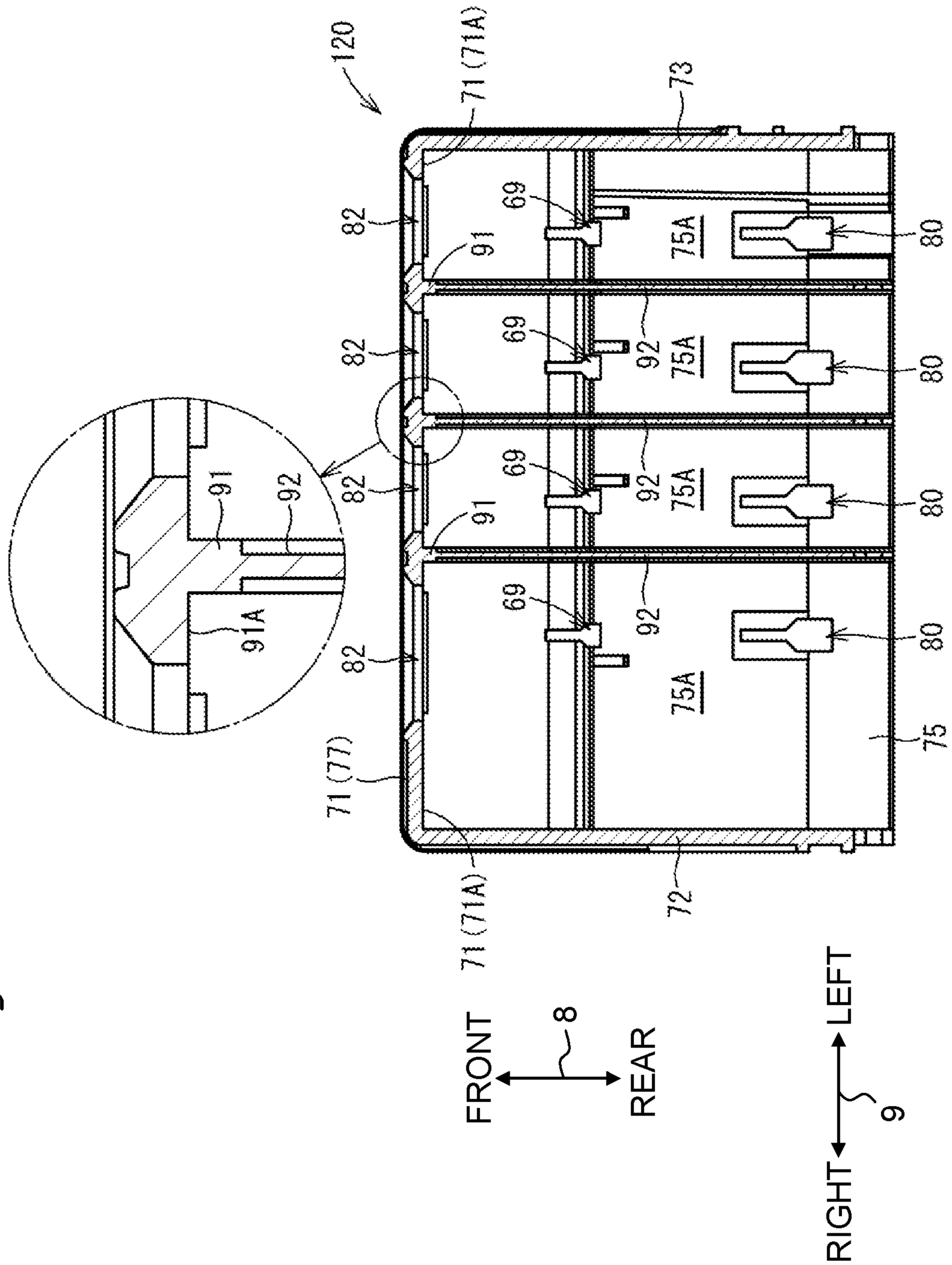

120
71 (71A)
73
82
69
91
75A
80
92
91A
71 (77)
72
75
FRONT
REAR
8
RIGHT
LEFT
9

Fig. 12

Fig. 13

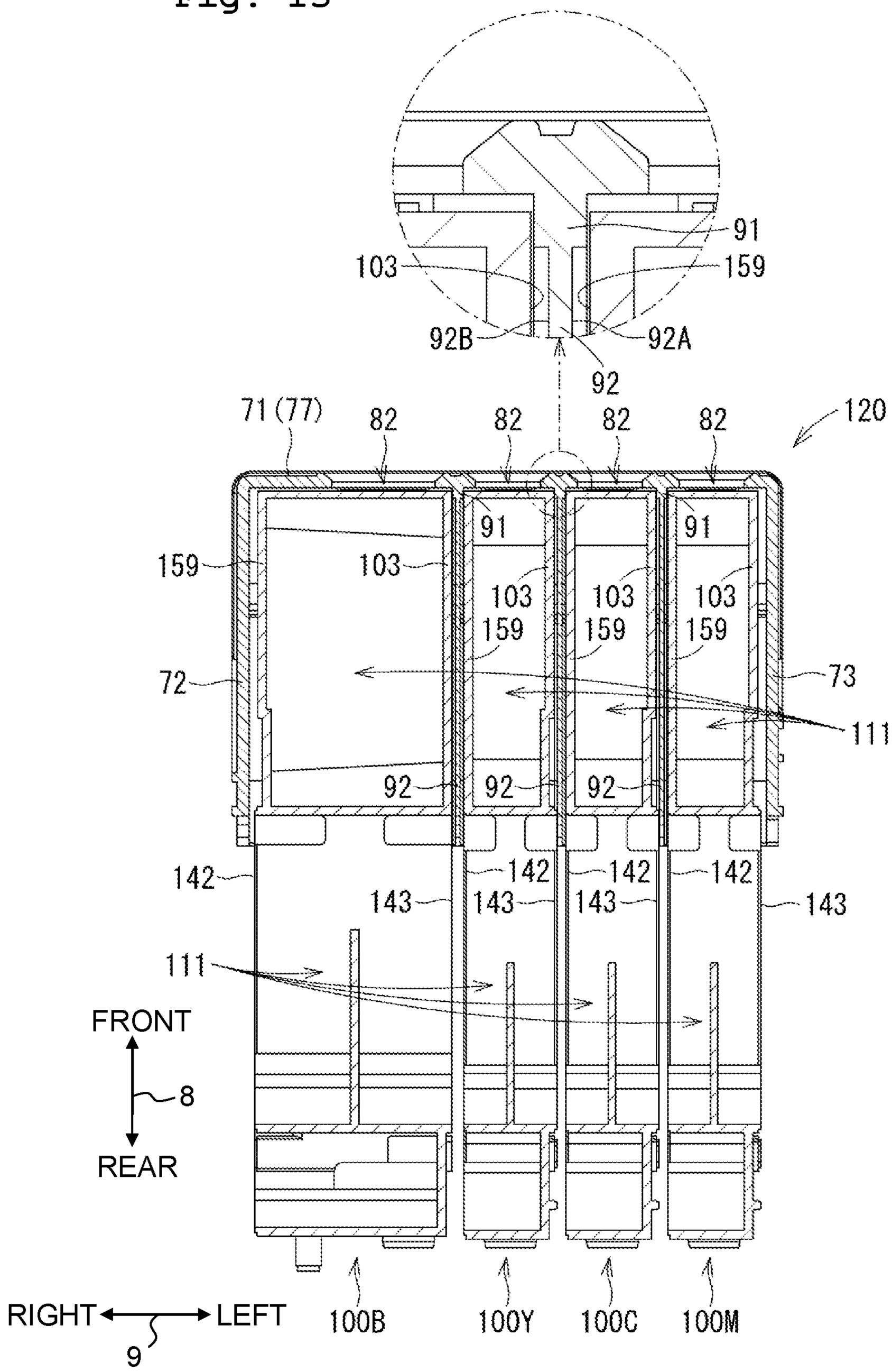

91
103
159
92B
92A
92
71 (77)
82
82
82
82
120
91
91
159
103
103
103
103
159
159
159
72
73
111
92
92
92
142
142
142
142
143
143
143
143
111
FRONT
8
REAR
RIGHT
9
LEFT
100B
100Y
100C
100M

Fig. 14A

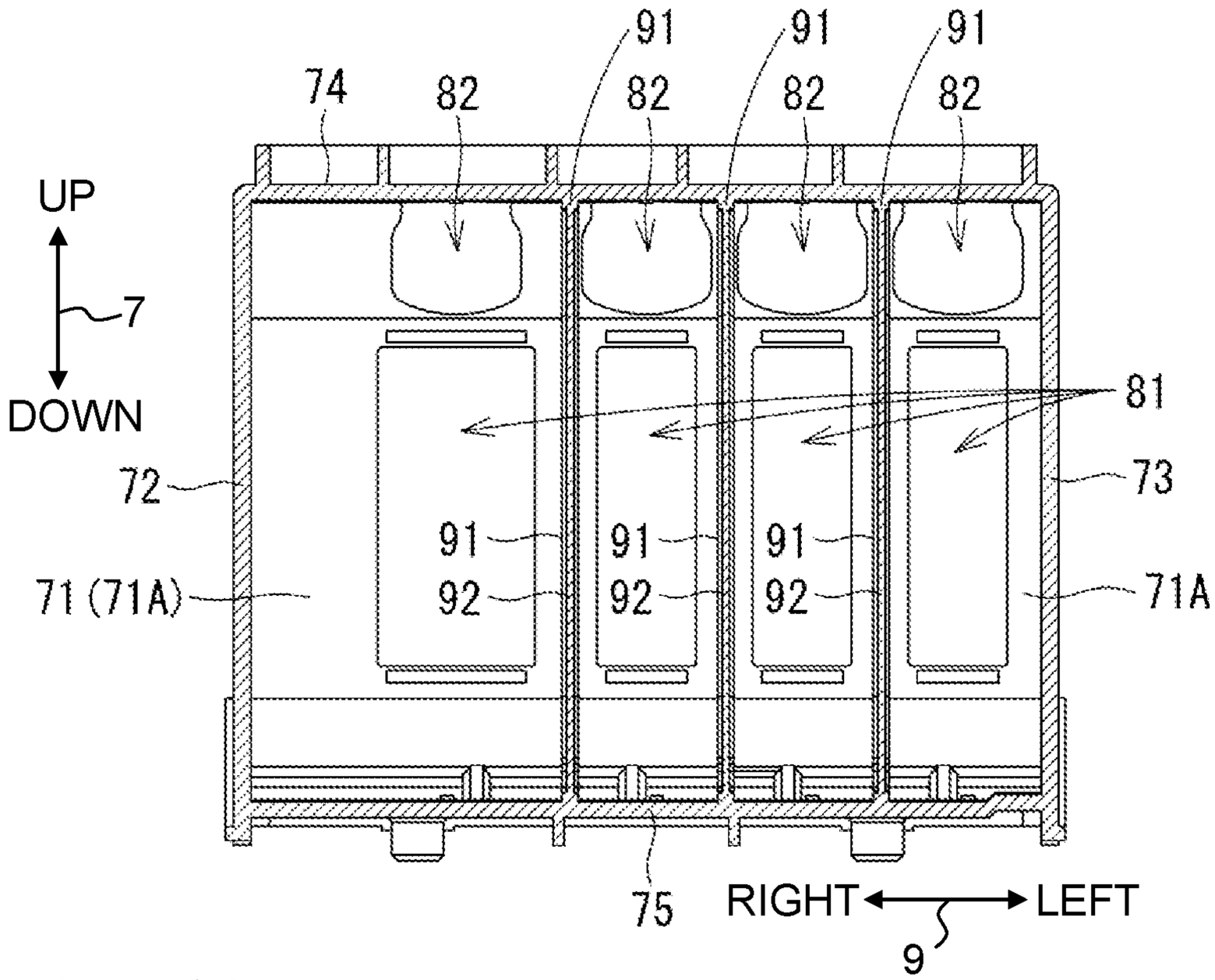
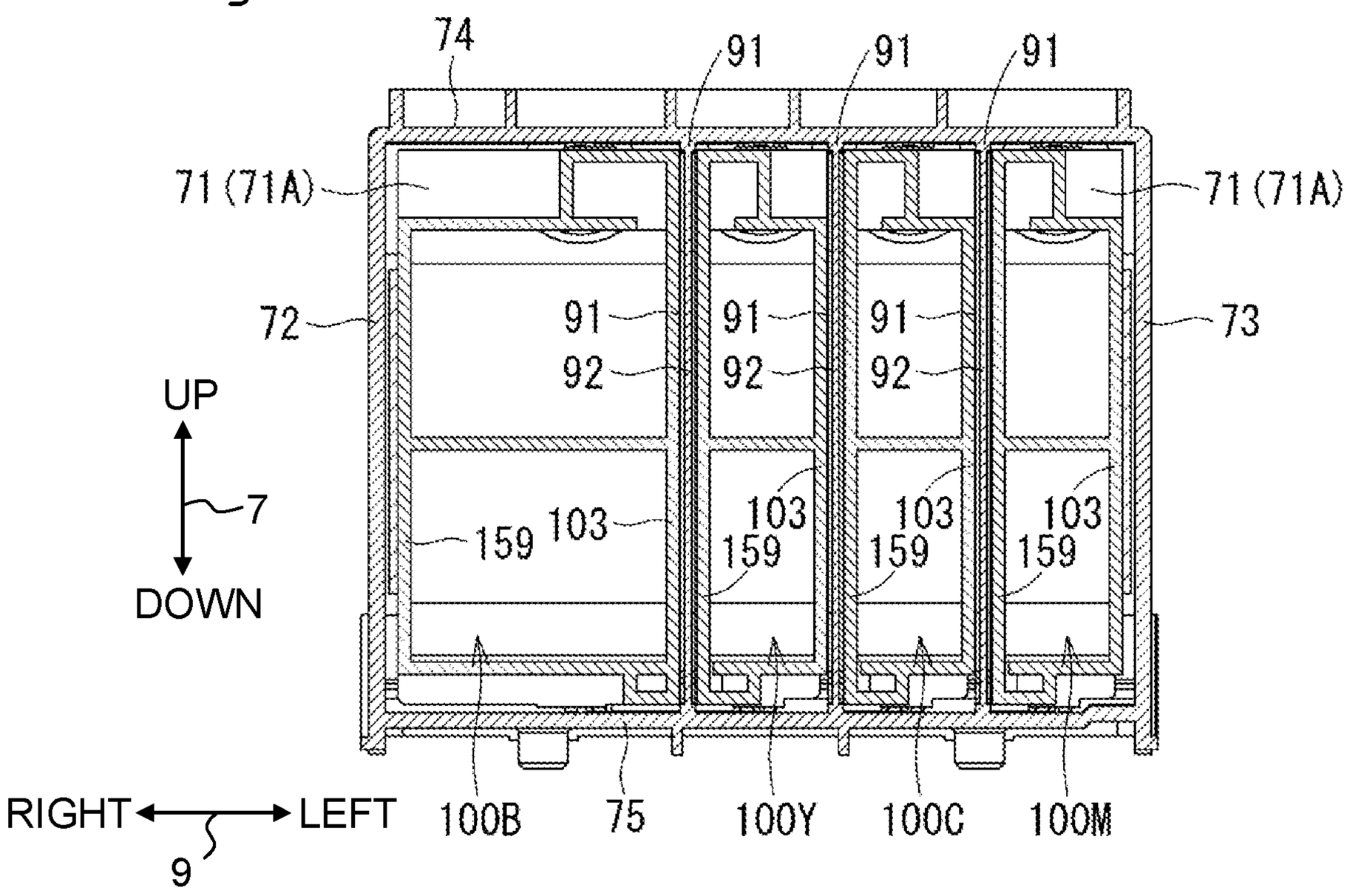


Fig. 14B



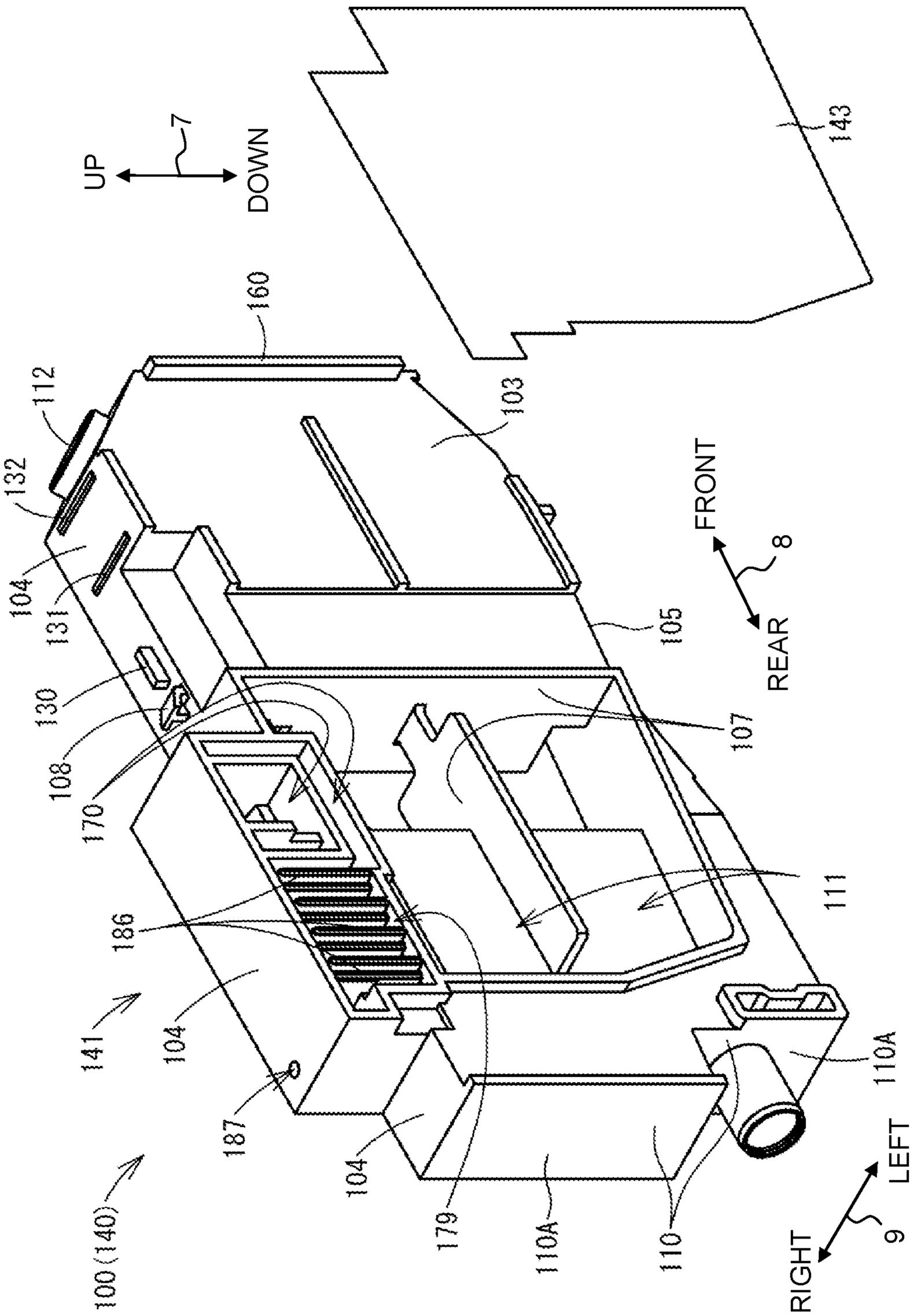
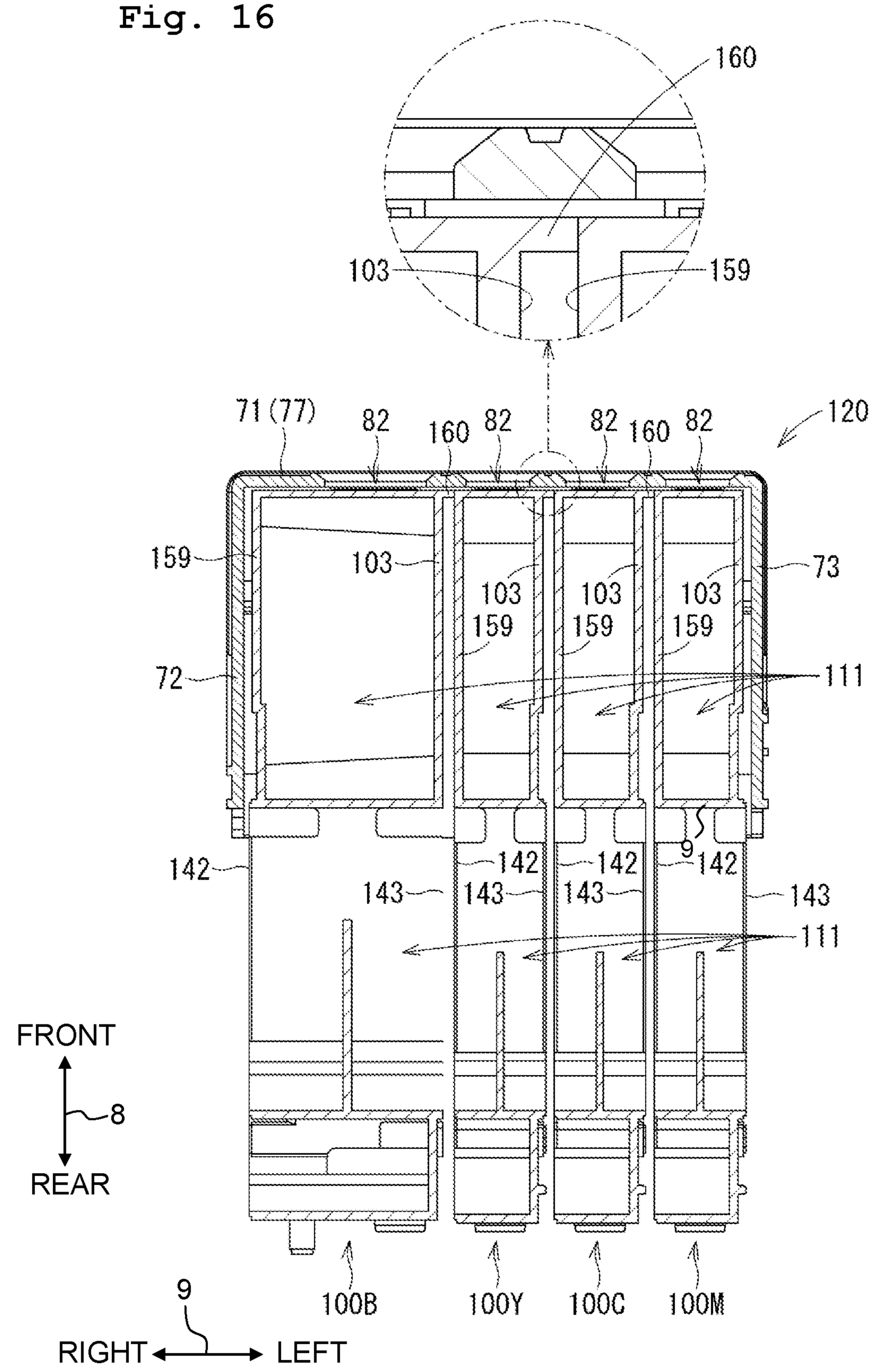

UP
DOWN
7
143
160
112
132
104
131
130
108
170
103
FRONT
8
REAR
105
107
186
141
104
187
104
179
110A
110
111
110A
100(140)
RIGHT
9
LEFT

Fig. 15

Fig. 16


160
103
159
71 (77)
82
160
82
82
160
82
120
159
103
103
103
103
73
159
159
159
72
111
142
142
142
142
143
143
143
143
111
FRONT
8
REAR
9
RIGHT
LEFT
100B
100Y
100C
100M

SUPPLY APPARATUS

CROSS REFERENCE TO RELATED APPLICATION

The present application is a continuation of U.S. patent application Ser. No. 15/883,554 filed on Jan. 30, 2018, which claims priority from Japanese Patent Application No. 2017-016366 filed on Jan. 31, 2017, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND

Field of the Invention

The present invention relates to a supply apparatus which includes tanks that can be replenished with liquid via inlets.

Description of the Related Art

There is known a printer that includes: tanks that can be replenished with ink; and a recording head that records an image on a sheet by discharging, from nozzles, the ink supplied from the tanks. When the ink in each of the tanks is consumed, a user can replenish with ink stored in a bottle, from an inlet provided in the tank.

SUMMARY

When each of the tanks is installed in the printer, each of the tanks is misaligned at least by tolerance. Thereupon, when the tanks are installed in the printer, a maximum value of misalignment will be a value of tolerance of each of the tanks multiplied by the number of tanks.

The above-described misalignment can be reduced by installing the tanks in the printer as a tank unit in a state that the tanks are aligned without gaps therebetween. As a result, the misalignment can be suppressed to a value of the tolerance of the tank unit.

However, when each of the tanks is configured such that a film is attached to a side surface facing the adjacent tank, and when the tanks are installed in the printer in a state that the tanks are aligned without gaps therebetween, the film could be damaged by making contact with the adjacent tank. Especially, when the films are attached to both side surfaces of the tank, the films are more likely to be damaged.

Thus, a binder may be used to integrate the tanks such that the tanks are arranged with gaps, and the tanks in an integrated state may be installed in the printer.

In that case, the tanks integrated by the binder have backlash between themselves and the binder caused at least by tolerance of the tanks. This backlash could cause a film of one of the two tanks that are arranged adjacent to each other while leaving a gap, to make contact with a film or flame of the other tank, thus damaging the film(s).

The present teaching has been made in view of the above circumstances, and an object of the present teaching is to provide a supply apparatus in which tanks having side surfaces, to which films are attached, are arranged adjacent to each other at intervals.

According to an aspect of the present teaching, there is provided a supply apparatus, including: tanks; a binder configured to hold the tanks in a state of being arranged in a first direction along a horizontal direction; a casing configured to support the binder; and a positioning part disposed between two tanks, of the tanks, disposed adjacent to each other, and the positioning part being configured to position

the two tanks at an interval in the first direction, wherein each of the tanks includes two side walls facing the first direction to define a liquid storage chamber and an inlet through which liquid is supplied to the liquid storage chamber, the two side walls include portions formed from resin, at least one of the two side walls includes a portion formed from a film which is more flexible than the resin, and the positioning part is in contact with: the portion formed from the resin of one of the two side walls of one of the two tanks; and the portion formed from the resin of one of the two side walls of the other of the two tanks.

In the above configuration, the positioning part is positioned between the two adjacent tanks. The positioning part is in contact with: one of the two side walls, of one of the two tanks, which is close to the other of the two tanks; and one of the two side walls, of the other of the two tanks, which is close to the one of the two tanks. This allows the two adjacent tanks to be held at an interval formed by the positioning part.

The positioning part is in contact with: the portion formed from the resin of one of the two side walls of one of the two tanks; and the portion formed from the resin of one of the two side walls of the other of the two tanks. This prevents the portion formed from the film of at least one of the two side walls from being damaged which may otherwise be caused by the contact with the positioning part.

According to the present teaching, when tanks having side surfaces, to which films are attached, are disposed adjacent to each other, two adjacent tanks, of the tanks, can be arranged at an interval.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. **1**A and **1**B are perspective views each depicting an external appearance of a multifunctional peripheral, wherein FIG. **1**A depicts a state in which a cover is closed and FIG. **1**B depicts a state in which the cover is open.

FIG. **2** is a longitudinal cross-sectional view schematically depicting an internal structure of a printer unit.

FIG. **3** is a plan view depicting an arrangement of a carriage and a tank set.

FIG. **4**A is a front perspective view of an ink tank, and FIG. **4**B is a rear perspective view of the ink tank.

FIG. **5**A is a front perspective view of an ink tank for black ink, and FIG. **5**B is a rear perspective view of the ink tank for black ink.

FIG. **6** is a right side view of the ink tank.

FIG. **7**A is a front perspective view of a tank set, and FIG. **7**B is a rear perspective view of the tank set.

FIG. **8**A is a front perspective view of a binder, and FIG. **8**B is a rear perspective view of the binder.

FIG. **9** is a longitudinal cross-sectional view of the ink tank and the binder.

FIG. **10** is a longitudinal cross-sectional view of the ink tank and the binder and the cover.

FIG. **11**A is a cross-sectional view taken along XIA-XIA in FIG. **7**B, and FIG. **11**B is a cross-sectional view taken along XIB-XIB in FIG. **7**B.

FIG. **12** is a cross-sectional view taken along XII-XII in FIG. **8**A.

FIG. **13** is a cross-sectional view taken along XIII-XIII in FIG. **7**A.

FIG. **14**A is a cross-sectional view taken along XIVA-XIVA in FIG. **8**A, and FIG. **14**B is a cross-sectional view taken along XIVB-XIVB in FIG. **7**B.

FIG. **15** is a rear perspective view of an ink tank according to a modified embodiment.

FIG. **16** is a cross-sectional view, of a binder holding ink tanks according to the modified embodiment, corresponding to the cross section taken along XIII-XIII in FIG. **7**A.

DESCRIPTION OF THE EMBODIMENTS

An embodiment of the present teaching will be described below. Note that the embodiment described below is merely an example of the present teaching, and it goes without saying that the embodiment of the present teaching may be appropriately changed in a range that does not alter the gist or essential characteristics of the present teaching. In the description below, a posture (the posture of FIGS. **1**A and **1**B) where a multifunction peripheral **10** and an ink tank **100** installed in the multifunction peripheral **10** are usably disposed in a horizontal plane will be described as a "usable posture". An up-down direction **7** is defined with reference to the usable posture. A front-rear direction **8** (an example of a second direction) is defined assuming a surface provided with an opening **13** of the multifunction peripheral **10** to be a front surface. A left-right direction **9** (an example of a first direction) is defined viewing the multifunction peripheral **10** from the front surface. The up-down direction **7**, the front-rear direction **8**, and the left-right direction **9** are orthogonal to each other. In the present embodiment, in the usable posture, the up-down direction **7** corresponds to a vertical direction, and the front-rear direction **8** and the left-right direction **9** correspond to horizontal directions. Note that an upward orientation is a component of the up-down direction **7**, and a downward orientation is also a component of the up-down direction **7**. Similarly, a leftward orientation and a rightward orientation are each components of the left-right direction **9**. A frontward orientation and a rearward orientation are each components of the front-rear direction **8**.

<Overall Structure of Multifunction Peripheral **10**>

As depicted in FIGS. **1**A and **1**B, the multifunction peripheral **10** (an example of a supply apparatus) has roughly a rectangular parallelepiped shape. A printer unit **11** that records an image on a sheet **12** (refer to FIG. **2**) by an ink-jet recording system, is provided in a lower section of the multifunction peripheral **10**. The printer unit **11** has a casing **14**. The opening **13** is formed in a front wall **14**A of the casing **14**. As depicted in FIG. **2**, the following are disposed on the inside of the casing **14**, namely, a feed unit **15**, a feed tray **20**, a discharge tray **21**, a conveyance roller unit **54**, a recording unit **24**, a discharge roller unit **55**, a platen **42**, a tank set **99**, and a binder **120** (refer to FIGS. **7**A and **7**B). The multifunction peripheral **10** has various functions such as a facsimile function and a print function.

<Feed Tray **20**, Discharge Tray **21**>

The opening **13** is formed in the front surface and in a central section in the left-right direction **9** of the multifunction peripheral **10**. As depicted in FIGS. **1**A and **1**B, the feed tray **20** is inserted/removed in the front-rear direction **8** into/from the multifunction peripheral **10**, via the opening **13**, by a user. The feed tray **20** can support a stacked plurality of the sheets **12**. The discharge tray **21** is disposed above the feed tray **20** and is inserted into and removed from the multifunction peripheral **10** together with the feed tray **20**. The discharge tray **21** supports the sheet **12** that has been discharged from between the recording unit **24** and the platen **42** by the discharge roller unit **55**.

<Feed Unit **15**>

The feed unit **15** feeds to a conveyance passage **65** the sheet **12** supported by the feed tray **20**. As depicted in FIG. **2**, the feed unit **15** includes a feed roller **25**, a feed arm **26**, and a shaft **27**. The feed roller **25** is rotatably supported by a distal end of the feed arm **26**. Reverse rotation of a conveyance motor (not illustrated) results in the feed roller **25** rotating such that the sheet **12** is conveyed in a conveyance orientation **16**. Hereafter, the feed roller **25**, a conveyance roller **60**, and a discharge roller **62** rotating in an orientation by which the sheet **12** is conveyed in the conveyance orientation **16** will be described as "forward rotation". The feed arm **26** is pivotably supported by the shaft **27** which is supported by a frame of the printer unit **11**. The feed arm **26** is biased so as to pivot toward the feed tray **20** by its own weight or elastic force of a spring or the like.

<Conveyance Passage **65**>

As depicted in FIG. **2**, the conveyance passage **65** is a passage that extends to a rear of the printer unit **11** from a rear end section of the feed tray **20**, makes a U-turn frontward while extending upwardly at the rear of the printer unit **11**, and passes along a space between the recording unit **24** and the platen **42** to reach the discharge tray **21**. Part of the conveyance passage **65** is a space formed by an outer guide member **18** and an inner guide member **19** that face each other with a certain spacing therebetween inside the printer unit **11**. As depicted in FIGS. **2** and **3**, a portion between the conveyance roller unit **54** and the discharge roller unit **55**, of the conveyance passage **65** is provided in roughly the central section in the left-right direction **9** of the multifunction peripheral **10**, and extends in the front-rear direction **8**. The conveyance orientation **16** of the sheet **12** in the conveyance passage **65** is indicated by a dot-chain line arrow in FIG. **2**.

<Conveyance Roller Unit **54**>

As depicted in FIG. **2**, the conveyance roller unit **54** is disposed in the conveyance passage **65**. The conveyance roller unit **54** includes the conveyance roller **60** and a pinch roller **61** that face each other. The conveyance roller **60** is driven by the conveyance motor. The pinch roller **61** rotates in company with rotation of the conveyance roller **60**. The sheet **12** is nipped by the pinch roller **61** and the conveyance roller **60** that forwardly rotates by forward rotation of the conveyance motor, whereby the sheet **12** is conveyed in the conveyance orientation **16**.

<Discharge Roller Unit **55**>

As depicted in FIG. **2**, the discharge roller unit **55** is disposed downstream in the conveyance orientation **16** of the conveyance roller unit **54** in the conveyance passage **65**. The discharge roller unit **55** includes the discharge roller **62** and a spur wheel **63** that face each other. The discharge roller **62** is driven by the conveyance motor. The spur wheel **63** rotates in company with rotation of the discharge roller **62**. The sheet **12** is nipped by the discharge roller **62** that forwardly rotates by forward rotation of the conveyance motor, and the spur wheel **63**, whereby the sheet **12** is conveyed in the conveyance orientation **16**.

<Recording Unit **24**>

As depicted in FIG. **2**, the recording unit **24** is disposed between the conveyance roller unit **54** and the discharge roller unit **55** in the conveyance orientation **16**. The recording unit **24** is disposed so as to face the platen **42** in the up-down direction **7**, sandwiching the conveyance passage **65** between itself and the platen **42**. The recording unit **24** includes a carriage **23** and a recording head **39**.

As depicted in FIG. **3**, the carriage **23** is supported by guide rails **43**, **44** that are disposed separated in the front-rear direction **8** and each provided extending in the left-right direction **9**. The guide rails **43**, **44** are supported by the frame of the printer unit **11**. The carriage **23** is coupled to a publicly known belt mechanism provided in the guide rail **44**. The belt mechanism is driven by a carriage motor (not illus-

trated). The carriage **23** coupled to the belt mechanism makes a reciprocating movement along the left-right direction **9** by drive of the carriage motor. A range of movement of the carriage **23** reaches to outer sides in the left-right direction **9** of the conveyance passage **65**, as depicted by the dot-chain lines of FIG. **3**.

Ink tubes **32** and a flexible flat cable **33** are extended out from the carriage **23**.

The ink tubes **32** connect the tank set **99** and the recording head **39**. The ink tubes **32** supply the recording head **39** with ink (an example of liquid) stored in four ink tanks **100**B, **100**Y, **100**C, **100**M (these are sometimes indicated collectively as "ink tank **100**") that configure the tank set **99**. The ink tank **100** is an example of a tank. In detail, four ink tubes **32**B, **32**Y, **32**C, **32**M in which black, yellow, cyan, magenta inks flow are respectively extended out from the ink tanks **100**B, **100**Y, **100**C, **100**M, and connected to the carriage **23** in a state that these ink tubes **32**B, **32**Y, **32**C, **32**M have been bundled. The four ink tubes **32**B, **32**Y, **32**C, **32**M are sometimes described collectively as "ink tube **32**".

The flexible flat cable **33** electrically connects a control board on which a control unit (not illustrated) is mounted and the recording head **39**. The flexible flat cable **33** transmits to the recording head **39** a control signal outputted from the control unit.

As depicted in FIG. **2**, the recording head **39** is mounted in the carriage **23**. Nozzles **40** are disposed in a lower surface of the recording head **39**. Tips of the nozzles **40** are exposed from the lower surface of the recording head **39**. The recording head **39** discharges ink from the nozzle **40** as minute ink droplets. In a process of the carriage **23** moving, the recording head **39** discharges the ink droplets toward the sheet **12** supported by the platen **42**. As a result, an image is recorded on the sheet **12**. Moreover, as a result, ink stored in the ink tanks **100**B, **100**Y, **100**C, **100**M is consumed.

<Platen **42**>

As depicted in FIGS. **2** and **3**, the platen **42** is disposed between the conveyance roller unit **54** and the discharge roller unit **55**, in relation to the conveyance orientation **16**. The platen **42** is disposed so as to face the recording unit **24** in the up-down direction **7**, sandwiching the conveyance passage **65** between itself and the recording unit **24**. The platen **42** supports, from below, the sheet **12** conveyed by the conveyance roller unit **54**.

<Cover **70**>

As depicted in FIG. **1**B, an opening **22** is formed in a right section of the front wall **14**A (an example of a side wall) of the casing **14**. A cover **70** is installed in the casing **14** so as to cover the opening **22**. The cover **70** is pivotable between a closed position where the opening **22** is covered (position depicted in FIG. **1**A) and an open position where the opening **22** is exposed (position depicted in FIG. **1**B).

A space extends rearward of the opening **22** inside of the casing **14**. The later-mentioned tank set **99** is disposed in this space. A front end of the space is demarcated by the cover **70** in the closed position. A rear end of the space is demarcated by an inner wall (not illustrated) disposed facing the cover **70** rearward of the cover **70**.

Note that in the present embodiment, the cover **70** moves to the closed position and the open position by pivoting. However, a movement mode between the closed position and the open position is not limited to pivoting. For example, the cover **70** may be configured to be attachable/detachable to/from the casing **14**. In this case, the cover **70** in a state of being attached to the casing **14** is the cover **70** in the closed position, and the cover **70** in a state of being detached from the casing **14** is the cover **70** in the open position.

<Tank Set **99**>

The tank set **99** stores the ink to be supplied to the recording head **39**. As depicted in FIGS. **7**A and **7**B, the tank set **99** includes the four ink tanks **100**B, **100**Y, **100**C, **100**M, the binder **120**.

Different colors of inks are stored in the ink tanks **100**B, **100**Y, **100**C, **100**M, respectively. Specifically, black ink is stored in the ink tank **100**B, yellow ink is stored in the ink tank **100**Y, cyan ink is stored in the ink tank **100**C, and magenta ink is stored in the ink tank **100**M. However, the number of ink tanks **100** and colors of the inks are not limited to the above-described example. Structure of each of the ink tanks **100** will be mentioned later.

The binder **120** holds the four ink tanks **100**B, **100**Y, **100**C, **100**M in a state of being aligned along the left-right direction **9**. Structure of the binder **120** will be mentioned later.

The four ink tanks **100**B, **100**Y, **100**C, **100**M are disposed in line along the left-right direction **9**. Of the four ink tanks **100**B, **100**Y, **100**C, **100**M, the ink tank **100**B is disposed most rightward, and the ink tank **100**M is disposed most leftward. Note that arrangement positions of the ink tanks **100** are not limited to the above-described example. The ink tank **100**B for black ink has a size, particularly a width in the left-right direction **9** which is larger than those of the ink tanks **100**Y, **100**C, **100**M for color inks. Note that a magnitude relationship of sizes of the ink tanks **100** is not limited to the above-described example. The ink tank **100**B has a permissible storage amount of ink which is larger than those of the other ink tanks **100**Y, **100**C, **100**M. Note that a magnitude relationship of permissible storage amounts of the ink tanks **100** is not limited to the above-described example.

As depicted in FIGS. **1**A and **1**B, the tank set **99** is installed in a right front section inside the casing **14**. In other words, the tank set **99** is fixed to the multifunction peripheral **10** such that it cannot be easily removed from the multifunction peripheral **10**. Note that "cannot be easily removed" means, for example, that the user cannot easily remove the tank set **99** from the casing **14** of the multifunction peripheral **10** in a state of ordinary use, and excludes cases such as when a skilled repairer removes the tank set **99** from the casing **14** of the multifunction peripheral **10** for repair. Therefore, the user should not be able to easily remove the tank set **99** from the casing **14** of the multifunction peripheral **10** in a state of ordinary use.

<Ink Tank **100**>

Structure of the ink tanks **100** will be described in detail below. Since structure of the ink tanks **100**Y, **100**C, **100**M for color inks are the same, hereafter, one of the ink tanks **100**Y, **100**C, **100**M will be referred to as the ink tank **100** and its structure will be described. Moreover, structure of the ink tank **100**B for black ink is similar to the structure of the ink tanks **100**Y, **100**C, **100**M, hence after the structure of the ink tanks **100**Y, **100**C, **100**M has been described, the structure of the ink tank **100**B for black ink will be described for portions different from in the ink tanks **100**Y, **100**C, **100**M. In this case, structure having a similar function even though shapes somewhat differ in the structure of the ink tank **100**B and the ink tanks **100**Y, **100**C, **100**M, will be assigned with identical reference symbols. Note that in the description below, unless specifically stated otherwise, the multifunction peripheral **10** and the ink tank **100** installed in the multifunction peripheral **10** are in the usable posture.

As depicted in FIGS. **4**A and **4**B, the ink tank **100** is formed by a casing **140** forming an outer shape of the ink tank. The casing **140** includes a frame **141** and two films **142**, **143**.

The frame **141** has a flat rectangular parallelepiped shape in which a dimension in the left-right direction **9** is short and dimensions in the up-down direction **7** and the front-rear direction **8** are longer than the dimension in the left-right direction **9**. Moreover, the dimension in the front-rear direction **8** is longer than the dimension in the up-down direction **7**.

The frame **141** is formed by a resin having sufficient translucency to enable ink in an ink chamber **111** to be visually confirmed from the outside of the ink tank **100**. The frame **141** is formed by, for example, polypropylene. The frame **141** is integrally molded by, for example, injection molding a resin material. Rigidity of the frame **141** is higher than rigidity of the films **142**, **143**. In other words, the films **142** and **143** are thinner and more flexible than the frame **141**. Therefore, the films **142** and **143** are broken by mechanical shock, external force, or the like, more easily as compared with the frame **141**.

Note that the frame **141** may have structure in which a plurality of members is combined, rather than being integrally molded.

The frame **141** includes a front wall **101**, a right wall **159**, a left wall **103**, an upper wall **104**, a lower wall **105**, a rear wall **110**, and inner walls **107**.

The front wall **101** is configured by an upright wall **102** and an inclined wall **106**. The upright wall **102** extends in the up-down direction **7** and the left-right direction **9**. The inclined wall **106** joins an upper end of the upright wall **102** and a front end of the upper wall **104**. The inclined wall **106** inclines with respect to the up-down direction **7** and the front-rear direction **8**.

A front surface **102**A of the upright wall **102** and a front surface **106**A of the inclined wall **106** in each of the ink tanks **100**, in other words a front surface of the frame **141** of each of the ink tanks **100**, is exposed to the outside of the multifunction peripheral **10**, via the opening **97** of the cover **70** and the opening **22** of the casing **14**. That is, each of the ink tanks **100** is disposed in the casing **14** such that the front portion (an example of an end) of the frame **141** is accessible from the outside of the casing **14** via the opening **22** and the opening **97**. Due to there being such structure, the front surface of the frame **141** of each of the ink tanks **100** is visually confirmable from a front of the multifunction peripheral **10**, and the user can visually confirm a residual amount of ink stored in each of the ink tanks **100**.

The right wall **159** extends rearward from a right end of the front wall **101**. An upper end of the right wall **159** is connected to a front section of the upper wall **104**. A lower end of the right wall **159** is connected to a front section of the lower wall **105**. In other words, the right wall **159** is provided only in a front section of the frame **141** and is not provided in a rear section of the frame **141**.

The left wall **103** extends rearward from a left end of the front wall **101**. An upper end of the left wall **103** is connected to the front section of the upper wall **104**. A lower end of the left wall **103** is connected to the front section of the lower wall **105**. In other words, the left wall **103** is provided only in the front section of the frame **141** and is not provided in the rear section of the frame **141**. The left wall **103** faces the right wall **159** in the left-right direction **9**.

The upper wall **104** extends rearward from an upper end of the front wall **101** (rear end of the inclined wall **106**). The front section of the upper wall **104** is connected to the upper end of the left wall **103**.

The lower wall **105** extends rearward from a lower end of the front wall **101**. The lower wall **105** is formed separated downwardly from the upper wall **104**. As mentioned above, the front section of the lower wall **105** is connected to the lower end of the left wall **103**.

A plurality of the inner walls **107** are disposed in a space surrounded by the front wall **101**, the left wall **103**, the upper wall **104**, the lower wall **105**, and the rear wall **110**.

As depicted in FIG. **4**A, a right surface of the frame **141** is open. The film **142** is welded to right surfaces of the lower wall **105**, the rear wall **110**, the upper wall **104**, and the inner walls **107**, whereby the right surface of the frame **141** is sealed.

As depicted in FIG. **4**B, a rear section of the left surface of the frame **141** is open. The film **143** is welded to left surfaces of the lower wall **105**, the rear wall **110**, the upper wall **104**, and the inner wall **107**, whereby the left surface of the frame **141** is sealed.

The front surface of the frame **141** (the front surface **102**A of the upright wall **102** and the front surface **106**A of the inclined wall **106**) is fastened by a front end of the right surface of the frame **141** and a front end of the left surface of the frame **141**. A rear surface of the frame **141** (a rear surface **110**A of the rear wall **110**) is fastened by a rear end of the right surface of the frame **141** and a rear end of the left surface of the frame **141**. The right surface of the frame **141** and the left surface of the frame **141** face each other in the left-right direction **9**.

As depicted in FIGS. **4**A, **4**B and **6**, a protrusion **108** is formed in the upper wall **104**. As depicted in FIG. **6**, the protrusion **108** is configured by a plate section **121** and a rib **122**. The plate section **121** has an inclined surface **123** extending upwardly rearward. The rib **122** is disposed so as to link the plate section **121** and the upper wall **104**. The rib **122** is shorter in the left-right direction **9** than the plate section **121**. Due to there being such structure, the protrusion **108** bends downwardly by force in at least one of a rearward or a downward orientation acting on the inclined surface **123**.

As depicted in FIG. **6**, a protrusion **109** is formed in the lower wall **105**. The protrusion **109** is configured by a plate section **124** and a rib **125**. The plate section **124** has an inclined surface **126** extending downwardly rearward. The rib **125** is disposed so as to link the plate section **124** and the lower wall **105**. The rib **125** is shorter in the left-right direction **9** than the plate section **124**. Due to there being such structure, the protrusion **109** bends upwardly by force in at least one of a rearward or an upward orientation acting on the inclined surface **126**.

As depicted in FIGS. **4**A and **4**B and FIG. **6**, a protrusion **130** is formed in the upper wall **104**. The protrusion **130** is formed on a front side of the protrusion **108**. The protrusion **130** extends in the front-rear direction **8**.

Protrusions **131** and **132** are formed in the upper wall **104**. The protrusions **131** and **132** are formed on a front side of the protrusion **130**. The protrusion **132** is formed on a front side of the protrusion **131**. The protrusions **131** and **132** extend in the left-right direction **9**.

As depicted in FIG. **6**, a protrusion **133** is formed in the lower wall **105**. The protrusion **133** is formed in a sub lower wall **105**A. The sub lower wall **105**A is formed in a front section of the lower wall **105**, and is positioned more upwardly than the lower wall **105**.

A protrusion **134** is formed in the lower wall **105**. The protrusion **134** is formed on a front side of the protrusion **109**. The protrusion **134** extends in the left-right direction **9**.

A protrusion **135** is formed in the sub lower wall **105**A. The protrusion **135** extends in the left-right direction **9**. In the present embodiment, the protrusion **135** extends to right and left from the protrusion **133**. A protruding length downward of the protrusion **135** is shorter than a protruding length downward of the protrusion **133**. In other words, a protruding tip of the protrusion **135** is positioned more upwardly than a protruding tip of the protrusion **133**.

<Ink Chamber **111**>

As depicted in FIGS. **4**A and **4**B, the casing **140** has the ink chamber **111** (an example of a liquid storage chamber) inside thereof. The ink chamber **111** is an internal space, of the ink tank **100**, to store ink.

The ink chamber **111** is demarcated by the front wall **101**, the right wall **159**, the left wall **103**, the upper wall **104**, the lower wall **105**, the rear wall **110**, the inner walls **107**, the film **142**, and the film **143**.

Specifically, a front side of the ink chamber **111** is demarcated by a rear surface of the front wall **101**. A rear side of the ink chamber **111** is demarcated by a front surface of the rear wall **110**. An upper side of the ink chamber **111** is demarcated by a lower surface of the upper wall **104**. A lower side of the ink chamber **111** is demarcated by an upper surface of the lower wall **105**. A right side of the ink chamber **111** is demarcated by a left surface of the right wall **159** and a left surface of the film **142**. Further, a left side of the ink chamber **111** is demarcated by a right surface of the left wall **103** and a right surface of the film **143**. The ink chamber **111** is divided into plural sub chambers by the inner walls **107**.

The left surface of the right wall **159** and the left surface of the film **142** face the right surface of the left wall **103** and the right surface of the film **143** in the left-right direction **9**. The left surface of the right wall **159** and the left surface of the film **142**, and the right surface of the left wall **103** and the right surface of the film **143** are examples of inner side surfaces of two side surfaces. In this embodiment, each of the two side surfaces has a portion formed from resin and a portion formed from a film. Each of the left surface of the right wall **159** and the right surface of the left wall **103**, which is formed from resin, is an example of a first surface. Each of the left surface of the film **142** and the right surface of the film **143** is an example of a second surface.

As described above, in this embodiment, the right and left sides of the ink chamber **111** are demarcated by the films (the films **142** and **143**) and the resin (the right wall **159** and the left wall **103**). However, one of the right and left sides of the ink chamber **111** may be demarcated only by the resin. For example, the right side of the ink chamber **111** may be demarcated by the film and the resin, and the left side of the ink chamber **111** may be demarcated only by the resin. Namely, the two side surfaces may include portions formed from the resin and one of the two side surfaces may include the portion formed from the film.

<Ink Outflow Passage **114**>

As depicted in FIG. **4**B, the casing **140** includes an ink outflow passage **114**. The ink outflow passage **114** is a communicating path for ink stored in the ink chamber **111** to flow out to outside of the ink tank **100**.

One end of the ink outflow passage **114** communicates with the ink chamber **111** via an opening **149** and an opening **150** (refer to FIG. **6**) formed in a boundary of the lower wall **105** and the rear wall **110**. The other end of the ink outflow passage **114** communicates with a protrusion **157** via an opening **156** formed in the rear wall **110**. The opening **156** is positioned above the openings **149**, **150**.

The protrusion **157** protrudes rearward from a peripheral portion of the opening **156** of the rear surface **110**A of the rear wall **110**, in other words, to outside of the ink tank **100**. The protrusion **157** is hollow. A front end of an internal space of the protrusion **157** communicates with the ink outflow passage **114** via the opening **156**. A rear end of the internal space of the protrusion **157** communicates with outside of the ink tank **100**.

The protrusion **157** is connected directly or indirectly to the ink tube **32** (see FIG. **3**) in a state that the ink tank **100** is installed in the casing **14**. This allows the ink, that has entered the internal space of the protrusion **157** from the ink outflow passage **114** via the opening **156**, to flow out to the ink tube **32**.

As described above, the ink stored in the ink chamber **111** is supplied to each nozzle **40** of the recording head **39** via the ink outflow passage **114**, the internal space of the protrusion **157**, and the ink tube **32**. The protrusion **157** may not be connected directly to the ink tube **32**. For example, a first end of a needle may be inserted into the protrusion **157**, and a second end of the needle may be connected to the ink tube **32**.

<Atmosphere Communication Passage **170**>

As depicted in FIGS. **4**A, **4**B, and **6**, the casing **140** has an atmosphere communication passage **170**. The atmosphere communication passage **170** communicates the ink chamber **111** and outside of the ink tank **100**. In other words, the atmosphere communication passage **170** opens the ink chamber **111** to the atmosphere.

One end of the atmosphere communication passage **170** communicates with the ink chamber **111** via openings **144**, **145**. The other end of the atmosphere communication passage **170** communicates with an air opening port **187** formed in the upper wall **104**.

As depicted in FIG. **6**, a semipermeable membrane **183** is attached between the one end and the other end of the atmosphere communication passage **170**, so as to block the atmosphere communication passage **170**. The semipermeable membrane **183** is a porous membrane having minute holes that block passage of ink and allow passage of gas. For example, the semipermeable membrane **183** is composed of a fluororesin such as polytetrafluoroethylene, polychlorotrifluoroethylene, tetrafluoroethylene-hexafluoropropylene copolymer, tetrafluoroethylene-perfluoroalkylvinyl ether copolymer, tetrafluoroethylene-ethylene copolymer, and so on. As a result, the ink stored in the ink chamber **111** is blocked by the semipermeable membrane **183** and thereby unable to flow out to outside of the ink tank **100** via the air opening port **187**. On the other hand, air can move freely between the inside of the ink chamber **111** and outside of the ink tank **100**.

As depicted in FIG. **4**B, a labyrinth **179** is formed between the air opening port **187** and a position where the semipermeable membrane **183** is attached in the atmosphere communication passage **170**. The labyrinth **179** is a communicating path that extends along the front-rear direction **8** while repeating U-turns in the up-down direction **7** by a plurality of separating walls **186** that extend in the up-down direction **7** being provided aligned in the front-rear direction **8**.

<Ink Tank **100**B>

The structure of the ink tank **100**B will be described below with reference to FIGS. **5**A and **5**B. As depicted in

FIGS. **5**A and **5**B, the ink tank **100**B is longer in the left-right direction **9** than the ink tanks **100**Y, **100**C, **100**M (refer to FIGS. **4**A and **4**B).

Portions, of the ink tank **100**B, different from the ink tanks **100**Y, **100**C, **100**M will be described below. Note that portions, in the ink tank **100**B, having the same structure as in the ink tanks **100**Y, **100**C, **100**M will be assigned with the same reference symbols as in FIGS. **4**A and **4**B, whereupon descriptions thereof will be omitted. Moreover, in the case that structure of a certain portion in the ink tank **100**B differs from structure of a portion corresponding to the certain portion of the ink tanks **100**Y, **100**C, **100**M only in being longer in the left-right direction **9** than the structure of the portion, of the ink tanks **100**Y, **100**C, **100**M, corresponding to the certain portion, the certain portion in the ink tank **100**B will be assigned with the same reference symbol as in FIGS. **4**A and **4**B, whereupon a description thereof will be omitted.

As depicted in FIG. **5**B, the frame **141** includes a protrusion **167** (an example of a detected part) protruding rearward from a lower portion of the rear wall **110**. An optical sensor **168** described below detects a height of a liquid surface of ink stored in the ink chamber **111** of the ink tank **100** having the usable posture by irradiating the protrusion **167** with light. The protrusion **167** has a rectangular parallelepiped shape. The protrusion **167** includes an internal space **167**A. A front end and a rear end of the protrusion **167** are open. The front end of the internal space **167**A of the protrusion **167** communicates with the ink chamber **111**. The rear end of the protrusion **167** is open. The opened rear end of the protrusion **167** is sealed with a film **139** attached thereto.

In this embodiment, the protrusion **167** is formed on a right side of the protrusion **157**. The protrusion **167**, however, may be formed in any other position. Further, in this embodiment, the protrusion **167** is provided only in the ink tank **100**B among the ink tanks **100**B, **100**Y, **100**C, and **100**M. The protrusion **167**, however, may be provided in at least one of the ink tanks **100**B, **100**Y, **100**C, and **100**M.

<Optical Sensor **168**>

As indicated by a broken line in FIG. **5**B, the printer unit **11** includes the optical sensor **168**. The optical sensor **168** is attached to the casing **14**. The optical sensor **168** is located on the right and left sides of the projection **167** of the frame **141** of the ink tank **100**B, in a state that the tank set **99** has been installed on the inside of the casing **14**.

The optical sensor **168** includes a light emitting section **168**A and a light receiving section **168**B. The light emitting section **168**A and the light receiving section **168**B are arranged to sandwich the projection **167** therebetween in the left-right direction **9**. The light emitting section **168**A is located on a right side of the projection **167**. The light receiving section **168**B is located on a left side of the projection **167**. Note that the arrangement positions of the light emitting section **168**A and the light receiving section **168**B may be opposite, regarding the left-right direction **9**, to the above-described arrangement positions.

The arrangement positions of the light emitting section **168**A and the light receiving section **168**B in the up-down direction **7** are determined, such that a light emitting position of the light emitting section **168**A toward the light receiving section **168**B and a light receiving position of the light receiving section **168**B from the light emitting section **168**A each have a predefined height in the internal space **167**A of the protrusion **167**.

The optical sensor **168** is electrically connected to a control unit (not depicted in the drawings) of the multifunction peripheral **10** via an electric circuit.

The light is emitted from the light emitting section **168**A toward the light receiving section **168**B. The emitted light penetrates the projection **167** to enter the internal space **167**A of the projection **167**. In a case that the liquid surface of the ink stored in the internal space **167**A is located above an optical path of the emitted light, the light is blocked (shielded) by the ink stored in the internal space **167**A and does not reach the light receiving section **168**B. This causes the optical sensor **168** to output a low level signal to the control unit. On the other hand, in a case that the liquid surface of the ink stored in the internal space **167**A is located below the optical path, the light advances in the air in the internal space **167**A. In that case, the light passes through the internal space **167**A and reaches the light receiving section **168**B. This causes the optical sensor **168** to output a high level signal to the control unit. Namely, a light-transmitting state of the protrusion **167** depends on the height of the liquid surface of the ink stored in the internal space **167**A.

In a case that the signal from the optical sensor **168** is the low level signal, the control unit determines that the liquid surface of the ink stored in the ink chamber **111** is higher than the predefined height; in a case that the signal from the optical sensor **168** is the high level signal, the control unit determines that the liquid surface of the ink stored in the ink chamber **111** is lower than the predefined height.

In this embodiment, the protrusion **167** is provided only in the ink tank **100**B and the optical sensor **168** is located on the right and left sides of the protrusion **167** of the frame **141** of the ink tank **100**B. However, when the protrusion **167** is provided for each of the ink tanks **100**Y, **100**C, and **100**M, the optical sensor **168** is provided on the right and left side of the protrusion **167** of the frame **141** of each of the ink tanks **100**Y, **100**C, and **100**M.

<Inlet **112**>

As depicted in FIG. **7**A, inlets **112**B, **112**Y, **112**C, **112**M (these are sometimes collectively described as "inlet **112**") for filling inks into the ink chambers **111** are formed in the inclined walls **106** of the ink tanks **100**B, **100**Y, **100**C, **100**M. The inlet **112** penetrates the inclined wall **106** in a thickness direction to communicate the ink chamber **111** with outside of the ink tank **100**.

The inclined wall **106** and the inlet **112** are exposed to outside of the multifunction peripheral **10** via the opening **22**, by the cover **70** being positioned in the open position. A posture (filling posture) of the ink tank **100** when ink is filled into the ink chamber **111** via the inlet **112**, is the usable posture. That is, ink is filled into the ink chamber **111** via the inlet **112** when the ink tank **100** is in the usable posture.

<Binder **120**>

As depicted in FIGS. **7**A and **7**B, the binder **120** holds the four ink tanks **100**B, **100**Y, **100**C, **100**M, in a state of being aligned in the left-right direction **9**.

As depicted in FIGS. **8**A and **8**B and FIG. **12**, the binder **120** includes a front wall **71**, a right wall **72**, a left wall **73**, an upper wall **74**, a lower wall **75**, positioning walls **91** (an exemplary positioning part), and partition walls **92**.

The front wall **71** is configured by an upright wall **76** and an inclined wall **77**. The upright wall **76** extends in the up-down direction **7** and the left-right direction **9**. The inclined wall **77** joins an upper end of the upright wall **76** and a front end of the upper wall **74**. The inclined wall **77** inclines with respect to the up-down direction **7** and the front-rear direction **8**.

The right wall **72** extends rearward from a right end of the front wall **71**. The left wall **73** extends rearward from a left end of the front wall **71**. The upper wall **74** extends rearward from an upper end of the front wall **71** (in detail, an upper

end of the inclined wall **77**). A right end of the upper wall **74** is connected to an upper end of the right wall **72**. A left end of the upper wall **74** is connected to an upper end of the left wall **73**. The lower wall **75** extends rearward from a lower end of the front wall **71**. A right end of the lower wall **75** is connected to a lower end of the right wall **72**. A left end of the lower wall **75** is connected to a lower end of the left wall **73**.

As depicted in FIG. **9**, a downwardly extending protrusion **78** is formed in the lower wall **75**. As depicted in FIG. **11**, the protrusion **78** is formed in each of a right end section and a left end section of the lower wall **75**. As depicted in FIG. **9**, the protrusion **78** is inserted into a hole **162** formed in a base plate **161** of the casing **14** of the printer unit **11**. As a result, the binder **120** is fixed in and supported by the casing.

The binder **120** is fixed in and supported by the casing **14** in a state that the binder **120** holds the ink tank **100** (the state depicted in FIGS. **7**A and **7**B).

As depicted in FIG. **8**B, an internal space **127** of the binder **120** is formed by the front wall **71**, the right wall **72**, the left wall **73**, the upper wall **74**, and the lower wall **75**. As depicted in FIGS. **7**A and **7**B, the four ink tanks **100**B, **100**Y, **100**C, **100**M are inserted from the rear toward the internal space **127**. As a result, front sections of the four ink tanks **100**B, **100**Y, **100**C, **100**M occupy the internal space **127**.

The internal space **127** is divided into spaces corresponding to the number of ink tanks **100** by the positioning walls **91** and the partition walls **92**. In this embodiment, the internal space **127** is divided into four internal spaces **127**B, **127**Y, **127**C, **127**M, which respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M, by the positioning walls **91** and the partition walls **92**.

As depicted in FIG. **12** and FIGS. **14**A and **14**B, the positioning walls **91** are formed in a rear surface **91**A of the front wall **71**. Namely, each positioning wall **91** is disposed in a position corresponding to a front section of the ink tank **100** held by the binder **120**. The positioning wall **91** protrudes from the rear surface **91**A. The positioning wall **91** extends from an upper end to a lower end of the rear surface **91**A. Namely, the positioning wall **91** is a protrusion protruding from the binder **120**.

The position of the positioning wall **91** in the left-right direction **9** is between two adjacent ink tanks **100** in the left-right direction **9**. Namely, the positioning walls **91** are disposed, in the left-right direction **9**, between the ink tank **100**B and the ink tank **100**Y, between the ink tank **100**Y and the ink tank **100**C, and between the ink tank **100**C and the ink tank **100**M.

In a state that the ink tank **100** is held by the binder **120**, a left surface of the positioning wall **91** positioned between the two adjacent ink tanks **100** is in contact with a right surface (an example of an outer side surface of the two side surfaces) of the right wall **159** of an ink tank **100**, of the two adjacent ink tanks **100**, positioned on the left side. In that state, a right surface of the positioning wall **91** positioned between the two adjacent ink tanks **100** is in contact with a left surface (an example of the outer side surface of the two side surfaces) of the left wall **103** of an ink tank **100**, of the two adjacent ink tanks **100**, positioned on the right side. Accordingly, the ink tanks **100** are positioned while leaving gaps or intervals in the left-right direction **9**.

In the state that the ink tank **100** is held by the binder **120**, the left surface of the positioning wall **91** positioned between the two adjacent ink tanks **100** has no contact with a right surface (an example of the outer side surface of the two side surfaces) of the film **142** of the ink tank **100**, of the two adjacent ink tanks **100**, positioned on the left side. Further, in the above state, a right surface of the positioning wall **91** positioned between the two adjacent ink tanks **100** has no contact with a left surface (an example of the outer side surface of the two side surfaces) of the film **143** of an ink tank **100**, of the two adjacent ink tanks **100**, positioned on the right side.

As described above, the positioning wall **91** is in contact with portions, of the side surfaces of the two adjacent ink tanks **100**, formed from resin.

As depicted in FIG. **12**, the partition wall **92** extends rearward from each positioning wall **91** to a rear end of the binder **120**. Namely, the partition wall **92** is formed integrally with the positioning wall **91**. The position of the partition wall **92** in the left-right direction **9** is between the two adjacent ink tanks **100** in the left-right direction **9**. Namely, the partition walls **92** are disposed, in the left-right direction **9**, between the ink tank **100**B and the ink tank **100**Y, between the ink tank **100**Y and the ink tank **100**C, and between the ink tank **100**C and the ink tank **100**M. An upper end of the partition wall **92** is connected to the upper wall **74**. A lower end of the partition wall **92** is connected to the lower wall **75**.

The thickness of the partition wall **92** in the left-right direction **9** is smaller than the thickness of the positioning wall **91** in the left-right direction **9**. The partition wall **92** extends rearward from a center of the positioning wall **91** in the left-right direction **9**. This allows each partition wall **92** to be disposed while leaving a gap between itself and the corresponding ink tank **100** in the left-right direction **9**.

As depicted in FIG. **13**, in a state that the ink tank **100** is held by the binder **120**, a rear end of a left surface **92**A (an example of a third surface) of the partition wall **92** positioned between the two adjacent ink tanks **100** faces the right surface of the film **142** of the ink tank **100**, of the two adjacent ink tanks **100**, positioned on the left side. In that state, a portion, of the left surface **92**A of the partition wall **92** positioned between the two adjacent ink tanks **100**, other than the rear end faces the right surface of the right wall **159** of the ink tank **100**, of the two adjacent ink tanks **100**, positioned on the left side.

As depicted in FIG. **13**, in a state that the ink tank **100** is held by the binder **120**, a rear end of a right surface **92**B (an example of a fourth surface) of the partition wall **92** positioned between two adjacent ink tanks **100** faces the left surface of the film **143** of the ink tank **100**, of the two adjacent ink tanks **100**, positioned on the right side. In that state, a portion, of the right surface **92**B of the partition wall **92** positioned between the two adjacent ink tanks **100**, other than the rear end faces the left surface of the left wall **103** of the ink tank **100**, of the two adjacent ink tanks **100**, positioned on the right side.

As described above, the partition wall **92** is disposed between the two adjacent ink tanks **100** such that the partition wall **92** has no contact with the two side surfaces of the ink tanks **100**.

As depicted in FIG. **8**, openings **79** are formed in a rear section of the upper wall **74**. The openings **79** respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M. In other words, in the present embodiment, four of the openings **79** are formed. Each of the openings **79** is formed in a position corresponding to the protrusion **108** (refer to FIGS. **4**A to **6**) of each of the ink tanks **100**, in a state that each of the ink tanks **100** has been inserted into the internal space **127**.

Openings **80** are formed in a rear section of the lower wall **75**. The openings **80** respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M. In other words, in the

present embodiment, four of the openings **80** are formed. Each of the openings **80** is formed in a position corresponding to the protrusion **109** (refer to FIG. **6**) of each of the ink tanks **100**, in a state that each of the ink tanks **100** has been inserted into the internal space **127**.

Openings **68** are formed in the upper wall **74**. Each of the openings **68** extends frontward from each of the openings **79**. In other words, in the present embodiment, four of the openings **68** are formed. Each of the openings **68** is formed in a position corresponding to the protrusion **130** (see FIG. **6**) of each of the ink tanks **100**, in a state that each of the ink tanks **100** has been inserted into the internal space **127**.

Openings **69** are formed in the lower wall **75**. The openings **69** respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M. In other words, in the present embodiment, four of the openings **69** are formed. In FIG. **8**B, only the opening **69** corresponding to the ink tank **100**B is depicted, and any other openings **69** are hidden by the partition walls **92**. The four openings **69** are each formed more frontward than the four openings **80**. Each of the openings **69** extends in the front-rear direction **8**. Each of the openings **69** is formed in a position corresponding to the protrusion **133** (refer to FIG. **6**) of each of the ink tanks **100**, in a state that each of the ink tanks **100** has been inserted into the internal space **127**.

In a process of each ink tank **100** being inserted into the internal space **127**, the protrusion **108** is pressed by abutting on a surface **74**A of the upper wall **74** on a side of the internal space **127** and thereby bends downwardly. Moreover, the protrusion **109** is pressed by abutting on a surface **75**A of the lower wall **75** on the side of the internal space **127** and thereby bends upwardly. When the ink tank **100** is further inserted, the protrusion **108** is inserted into the opening **79** and the protrusion **109** is inserted into the opening **80**. As a result, bending of the protrusions **108**, **109** is released.

In this state, the protrusion **108** engages with the opening **79** and the protrusion **109** engages with the opening **80**.

In an engaged state of the protrusion **108** and the opening **79**, if a user attempts to move the ink tank **100** frontward with respect to the binder **120**, the protrusion **108** abuts on a front edge surface **79**A demarcating a front end of the opening **79**. As a result, frontward movement of the ink tank **100** with respect to the binder **120** is restricted. Moreover, in an engaged state of the protrusion **108** and the opening **79**, if the user attempts to move the ink tank **100** rearward with respect to the binder **120**, the protrusion **108** abuts on a rear edge surface **79**B demarcating a rear end of the opening **79**. As a result, rearward movement of the ink tank **100** with respect to the binder **120** is restricted.

In an engaged state of the protrusion **109** and the opening **80**, if the user attempts to move the ink tank **100** frontward with respect to the binder **120**, the protrusion **109** abuts on a front edge surface **80**A demarcating a front end of the opening **80**. As a result, frontward movement of the ink tank **100** with respect to the binder **120** is restricted. Moreover, in an engaged state of the protrusion **109** and the opening **80**, if the user attempts to move the ink tank **100** rearward with respect to the binder **120**, the protrusion **109** abuts on a rear edge surface **80**B demarcating a rear end of the opening **80**. As a result, rearward movement of the ink tank **100** with respect to the binder **120** is restricted.

As described above, by the protrusion **108** abutting on an edge surface of the opening **79** and the protrusion **109** abutting on an edge surface of the opening **80**, the ink tank **100** is positioned in the front-rear direction **8**.

Moreover, in a state that the protrusion **108** and opening **79** are engaged and the protrusion **109** and opening **80** are engaged, as depicted in FIG. **10**, the protrusions **131**, **132** abut on the surface **74**A of the upper wall **74** on the side of the internal space **127**, and the protrusions **134**, **135** abut on the surface **75**A of the lower wall **75** on the side of the internal space **127**. As a result, the ink tank **100** is positioned in the up-down direction **7**. There may be a gap, which substantially corresponds to tolerance, between the protrusions **131**, **132** and the surface **74**A.

Moreover, in a state that the protrusion **108** and opening **79** are engaged and the protrusion **109** and opening **80** are engaged, the protrusion **130** is inserted into the opening **68**, as depicted in FIG. **11**A. In an inserted state of the protrusion **130** into the opening **68**, if the user attempts to move the ink tank **100** rightward with respect to the binder **120**, the protrusion **130** abuts on a right edge surface **68**A demarcating a right end of the opening **68**. Moreover, in an inserted state of the protrusion **130** into the opening **68**, if the user attempts to move the ink tank **100** leftward with respect to the binder **120**, the protrusion **130** abuts on a left edge surface **68**B demarcating a left end of the opening **68**.

Moreover, in a state that the protrusion **108** and opening **79** are engaged and the protrusion **109** and opening **80** are engaged, the protrusion **133** is inserted into the opening **69**, as depicted in FIG. **11**B. In an inserted state of the protrusion **133** into the opening **69**, if the user attempts to move the ink tank **100** rightward with respect to the binder **120**, the protrusion **133** abuts on a right edge surface **69**A demarcating a right end of the opening **69**. Moreover, in an inserted state of the protrusion **133** into the opening **69**, if the user attempts to move the ink tank **100** leftward with respect to the binder **120**, the protrusion **133** abuts on a left edge surface **69**B demarcating a left end of the opening **69**.

As described above, the ink tank **100** is positioned in the left-right direction **9** by the protrusion **130** abutting on the edge surfaces of the opening **68** and the protrusion **133** abutting on the edge surfaces of the opening **69**. Here, as described above, the ink tank **100** is positioned in the left-right direction **9** by the right wall **159** and the left wall **103** abutting on the positioning wall **91**. Namely, in the present embodiment, the front end of the ink tank **100** is positioned in the left-right direction **9** by the positioning wall **91**, and a rear section of the front end of the ink tank **100** is positioned in the left-right direction **9** by the edge surfaces of the openings **68** and **69**.

As depicted in FIGS. **11**A and **11**B, in a positioned state in the left-right direction **9**, a gap **98** is formed between adjacent ink tanks **100**.

As described above, the binder **120** holds the four ink tanks **100**B, **100**Y, **100**C, **100**M in a state of being aligned in the left-right direction **9**, as depicted in FIGS. **7**A and **7**B. Note that an arrangement order of the ink tanks **100** is, in order from the right, the ink tank **100**B, the ink tank **100**Y, the ink tank **100**C, and the ink tank **100**M.

In a state of the binder **120** holding the ink tank **100**, the front wall **71** covers the front wall **101** of the ink tank **100**, the upper wall **74** covers a front section of the upper wall **104** of the ink tank **100**, and the lower wall **75** covers a front section of the lower wall **105** of the ink tank **100**.

Moreover, in a state of the binder **120** holding the ink tank **100**, the right wall **72** covers a front section of a right surface (the right wall **159**) of the ink tank **100**B disposed most rightward of the four ink tanks **100**, and the left wall **73** covers a front section of a left surface (the left wall **103**) of the ink tank **100**M disposed most leftward of the four ink tanks **100**.

As described above, the binder **120** in a state of holding the ink tank **100** covers the front section of the ink tank **100**.

As depicted in FIG. **8**A, openings **81** are formed in the upright wall **76** of the front wall **71** of the binder **120**. The openings **81** are formed while leaving gaps therebetween in the left-right direction **9**. The openings **81** respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M. In other words, in the present embodiment, four of the openings **81** are formed. In the present embodiment, a shape of each of the openings **81** is a rectangle, but may be other than a rectangle.

As depicted in FIG. **7**A, in a state of the binder **120** holding each of the ink tanks **100**, the upright wall **102** of the front wall **101** of each of the ink tanks **100** is exposed to outside of the binder **120** via the opening **81**. Moreover, as depicted in FIG. **1**A, in a state of the binder **120** holding each of the ink tanks **100** and a state of the cover **70** being in the closed position, the upright wall **102** of each of the ink tanks **100** is exposed to outside of the printer unit **11** via the opening **81** of the binder **120** and the opening **97** of the cover **70**. This allows the user to confirm a remaining amount of ink stored in each ink tank **100**, from the outside of the printer unit **11**.

As depicted in FIGS. **8**A and **8**B, openings **82** are formed in the inclined wall **77** of the front wall **71** of the binder **120**. The openings **82** are formed while leaving gaps in the left-right direction **9**. The openings **82** respectively correspond to the four ink tanks **100**B, **100**Y, **100**C, **100**M. In other words, in the present embodiment, four of the openings **82** are formed. In the present embodiment, a shape of each of the openings **82** is a circle, but may be other than a circle.

As depicted in FIG. **7**A, in a state of the binder **120** holding each of the ink tanks **100**, the inlet **112** of each of the ink tanks **100** is exposed to outside of the binder **120** via the opening **82**.

As depicted in FIGS. **8**A and **8**B, a cap attachment section **155**, to which a later-mentioned cap **113** is attached, is formed in a front section of the upper wall **74** of the binder **120**.

<Cap **113**>

As depicted in FIGS. **7**A and **7**B, the ink tank **100** includes caps **113**B, **113**Y, **113**C, **113**M (these are sometimes collectively described as "cap **113**"). The ink tank **100** includes the four caps **113**B, **113**Y, **113**C, **113**M corresponding to the four inlets **112**B, **112**Y, **112**C, **112**M of the ink tank **100**.

Each of the caps **113** is molded by a material capable of elastic deformation such as rubber or elastomer. Each of the caps **113** includes a cap section **115**, an elastic deformation section **116**, and an attaching section **117**. Note that structure of each of the caps **113** is not limited to structure described below.

The cap section **115** has an appearance substantially in a shape of disc.

The elastic deformation section **116** is strip shaped. One end of the elastic deformation section **116** is connected to the cap section **115**. The other end of the elastic deformation section **116** is connected to the attaching section **117**. The elastic deformation section **116**, in a state of not being applied with a force from outside, is in a state of extending roughly straight, as depicted in FIGS. **7**A and **7**B.

The attaching section **117** is capable of being fitted to the cap attachment section **155**. This allows the cap **113** to be attached to the binder **120**.

The cap **113** seals the inlet **112** in a liquid-tight manner by the cap section **115** closely contacting a wall surface demarcating a peripheral edge of the inlet **112**. In that situation, although not illustrated in the drawings, the elastic deformation section **116** is curved in a circular arc shape.

As depicted in FIGS. **7**A and **7**B, the inlet **112** is opened by separating the cap section **115** from the inlet **112**. This allows the ink to be filled into the ink chamber **111** through the inlet **112**. In a state of the cap **113** being positioned in the separated position, the elastic deformation section **116** undergoes elastic recovery to extend roughly straight.

Function and Effect of the Embodiment

In the present embodiment, the positioning wall **91** is positioned between two adjacent ink tanks **100**, as depicted in FIG. **13**. Further, the positioning wall **91** is in contact with the outer side surfaces (the right surface of the right wall **159** of the left ink tank **100** and the left surface of the left wall **103** of the right ink tank **100**) of the side surfaces facing each other of the two adjacent ink tanks **100**. This allows the two adjacent ink tanks **100** to be held while leaving a gap formed by the positioning wall **91**.

Although the positioning wall **91** is in contact with the right wall **159** and the left wall **103** that are formed from resin, the positioning wall **91** has no contact with the films **142** and **143**. This reduces the possibility that the films **142** and **143** are damaged by the contact with the positioning wall **91**.

If the positioning walls **91** are formed as protrusions protruding from the right surface of the right wall **159** and the left surface of the left wall **103** of the ink tank **100**, a predefined gap is required to be provided between the protrusion formed in the right surface of the ink tank **100** and the film **142**, and a predefined gap is required to be provided between the protrusion formed in the left surface of the ink tank **100** and the film **143**. Those predefined gaps make the ratio of the right wall **159** in the right surface of the ink tank **100** and the ratio of the left wall **103** in the left surface of the ink tank **100** larger. Then, the ratio of the film **142** in the right surface of the ink tank **100** and the ratio of the film **143** in the left surface of the ink tank **100** are smaller. As a result, the amount of ink stored in the ink chamber **111** is smaller.

In the present embodiment, each positioning wall **91** is formed in the binder **120**. This allows the gap between the protrusion formed in the right surface of the ink tank **100** and the film **142** to be smaller than the predefined gap, and allows the gap between the protrusion formed in the left surface of the ink tank **100** and the film **143** to be smaller than the predefined gap. Thus, the ratio of the film **142** in the right surface of the ink tank **100** is allowed to be large and the ratio of the film **143** in the left surface of the ink tank **100** is allowed to be large. As a result, the amount of ink stored in the ink chamber **111** can be increased without making the volume of the ink tank **100** large.

When there is a gap between two adjacent ink tanks **100**, light may enter the ink tank **100** through the gap. The light entering the ink tank **100** may change, for example, the quality of ink stored in the ink chamber **111**. In the present embodiment, the partition wall **92** is disposed between the two adjacent ink tanks **100**. This reduces light from entering the ink tank **100**.

The partition wall **92** is disposed in a position having no contact with the side surfaces facing each other (the right surface of the right wall **159** and the right surface of the film **142** of the left ink tank **100**, and the left surface of the left wall **103** and the left surface of the film **143** of the right ink tank **100**) of the two adjacent ink tanks **100**. This can reduce the possibility that the two side surfaces are damaged by contacting with the partition wall **92**.

In the present embodiment, the partition wall **92** extends from the positioning wall **91**. This allows the partition wall **92** and the positioning wall **91** to be molded integrally.

Although the light from the outside is highly likely to enter the ink tank **100** through an end (front ends of the ink tank **100** and the binder **120**) accessible to the ink tank **100** from the outside of the casing **14**, in the present embodiment, the positioning wall **91** is disposed at the end. Thus, the positioning wall **91** reduces light that may otherwise enter the ink tank **100** from the outside.

In the present embodiment, the positioning wall **91** and the partition wall **92** reduce light coming from the outside and reaching the optical sensor **168** and the protrusion **167**. This reduces the possibility of false detection of the optical sensor **168**.

Modified Embodiments

In the above embodiment, the positioning wall **91** is disposed to extend from the upper end to the lower end of the rear surface **91**A (see FIG. **12**) of the front wall **71**. The positioning wall **91**, however, may be disposed at any other position, provided that the positioning wall **91** has no contact with the films **142** and **143** in a state that the ink tank **100** is held by the binder **120**.

For example, the positioning wall **91** may be formed only at a center of the rear surface **91**A in the up-down direction **7**, or the positioning walls **91** may be formed only at the upper end and the lower end of the rear surface **91**A.

The positioning wall **91** may be formed in any other surface than the rear surface **91**A of the front wall **71**. For example, the positioning wall(s) **91** may be formed in the surface **74**A of the upper wall **74** on the side of the internal space **127** (see FIG. **10**) and/or the surface **75**A of the lower wall **75** on the side of the internal space **127** (see FIG. **10**). Namely, the positioning wall **91** may be disposed in any position except for the front section of the frame **141** in a state that the ink tank **100** and the binder **120** are installed on the inside of the casing **14**. For example, the positioning wall **91** may be disposed in the rear section of the frame **141**.

In the above embodiment, the partition wall **92** is formed integrally with the positioning wall **91**. The partition wall **92**, however, may be formed independently of the positioning wall **91**. Namely, the partition wall **92** may be disposed while leaving a gap between itself and the positioning wall **91**.

In the above embodiment, the partition wall **92** extends from a front end to a rear end of the internal space **127** of the binder **120** and extends from an upper end to a lower end of the internal space **127** of the binder **120**. The arrangement range of the partition wall **92** is not limited to the above. For example, the partition wall **92** may be disposed only at the front or rear section in the front-rear direction **8** in the internal space **127** of the binder **120**, or may be disposed only at the upper or lower section in the up-down direction **7** in the internal space **127** of the binder **120**.

In the above embodiment, the binder **120** includes the positioning walls **91** and the partition walls **92**. The binder **120**, however, may not include the partition walls **92**. In that case, the internal space **127** of the binder **120** is divided into a plurality only by the positioning walls **91**.

In the above embodiment, the positioning of the ink tank **100** in the left-right direction **9** is made by using the positioning wall **91** and the protrusions **130**, **133**. The positioning of the ink tank **100** in the left-right direction **9**, however, may be made only by the positioning wall **91**.

In the above embodiment, as depicted in FIGS. **4**A, **4**B and FIG. **5**, the right wall **159** and the left wall **103** of the ink tank **100** are provided in the front section of the frame **141**. The right wall **159** and the left wall **103**, however, may be provided in any other section than the front section of the frame **141**. For example, the right wall **159** and the left wall **103** may be provided in the rear section of the frame **141**. Or, for example, the right wall **159** may be provided in the front section of the frame **141** and the left wall **103** may be provided in the rear section of the frame **141**. The positions of the films **142**, **143** and the position of the positioning wall **91** are determined based on the positions of the right wall **159** and the left wall **103**.

In the above embodiment, the positioning walls **91** are formed in the binder **120**. The positioning walls **91**, however, may be formed in the ink tanks **100**.

For example, as depicted in FIG. **15**, the positioning wall **91** may be a rib **160** protruding leftward from a front end of the left wall **103** of the ink tank **100**. In that case, as depicted in FIG. **16**, a protruding tip of the rib **160** of a predefined ink tank **100** is in contact with the right wall **159** of the ink tank **100** disposed on the left side of the predefined ink tank **100**. Accordingly, the ink tanks **100** are arranged in the left-right direction **9**. The position of the rib **160** is not limited to the front end of the left wall **103**. For example, the rib **160** may be formed in a rear end of the left wall **103**. Or, for example, the rib **160** may protrude rightward from the right wall **159**.

In the configuration in which the rib **160** is formed in the ink tank **100**, each partition wall **92** is disposed in the binder **120** at a position having no contact with the rib **160** in a process of inserting the ink tank **100** into the internal space **127** of the binder **120**. For example, when the ribs **160** are formed in the upper end and the lower end of the ink tank **100**, the partition wall **92** is formed in a center of the binder **120** in the up-down direction **7**. In the configuration in which the rib **160** is formed in the ink tank **100**, the binder **120** may include no partition wall **92**.

In the above embodiment, the protrusion **167** is disposed in the lower section of the rear wall **110**. The protrusion **167**, however, may be disposed in any other section than the lower section of the rear wall **110**. For example, the protrusion **167** may be disposed in a lower section of the front wall **101**. In that case, it is needless to say that the arrangement position of the optical sensor **168** depends on the arrangement position of the protrusion **167**.

In the above embodiment, the optical sensor **168** and the protrusion **167** detect a height of a liquid surface of ink stored in the ink chamber **111**. The present teaching may adopt any other detection means than the optical sensor **168** and the protrusion **167**.

For example, a prism may be disposed in the ink chamber **111**. In that configuration, the optical sensor **168** may detect a receiving state of light irradiating the prism to obtain a height of a liquid surface of ink stored in the ink chamber **111**. Further, for example, a rotating member that rotates depending on a height of a liquid surface of ink may be disposed in the ink chamber **111**. In that configuration, the optical sensor **168** may detect a receiving state of light irradiating the rotating member to obtain the height of the liquid surface of ink stored in the ink chamber **111**. Further, for example, two electrodes, of which lower ends have different heights, may be disposed in the ink chamber **111**. In that configuration, a height of a liquid surface of ink stored in the ink chamber **111** may be detected based on whether current flows in a state that a distance between the two electrodes is filled with ink.

In the above embodiment, ink was described as an example of liquid. However, the present teaching is not limited to this. That is, a pretreatment liquid discharged onto a recording sheet prior to the ink during printing, water sprayed in a vicinity of the nozzle **40** of the recording head **39** for preventing drying of the nozzle **40** of the recording head **39**, and the like, are also examples of liquid.

What is claimed is:

1. A supply apparatus, comprising:

tanks each having a casing, the casing including a frame and films having rigidity lower than that of the frame, the frame having a front wall, a rear wall, an upper wall, a lower wall, a left wall and a right wall, one of the films being welded to at least a part of the left wall, another of the films being welded to at least a part of the right wall, the casing having a liquid storage chamber at least a part of which is defined by the films and an inlet through which liquid is supplied to the liquid storage chamber;

a binder configured to hold the tanks in a state of being arranged in a left-right direction; and

a positioning part configured to position two tanks at an interval in the left-right direction, the two tanks being included in the tanks and disposed adjacent to each other in the left-right direction,

wherein the positioning part is disposed between the two tanks in the left-right direction and in contact with the frame of each of the two tanks.

2. The supply apparatus according to claim **1**, wherein the positioning part is formed in the binder.

3. The supply apparatus according to claim **2**, further comprising a partition wall disposed between the two tanks and having no contact with the two tanks.

4. The supply apparatus according to claim **3**, wherein the partition wall extends from the positioning part.

* * * * *